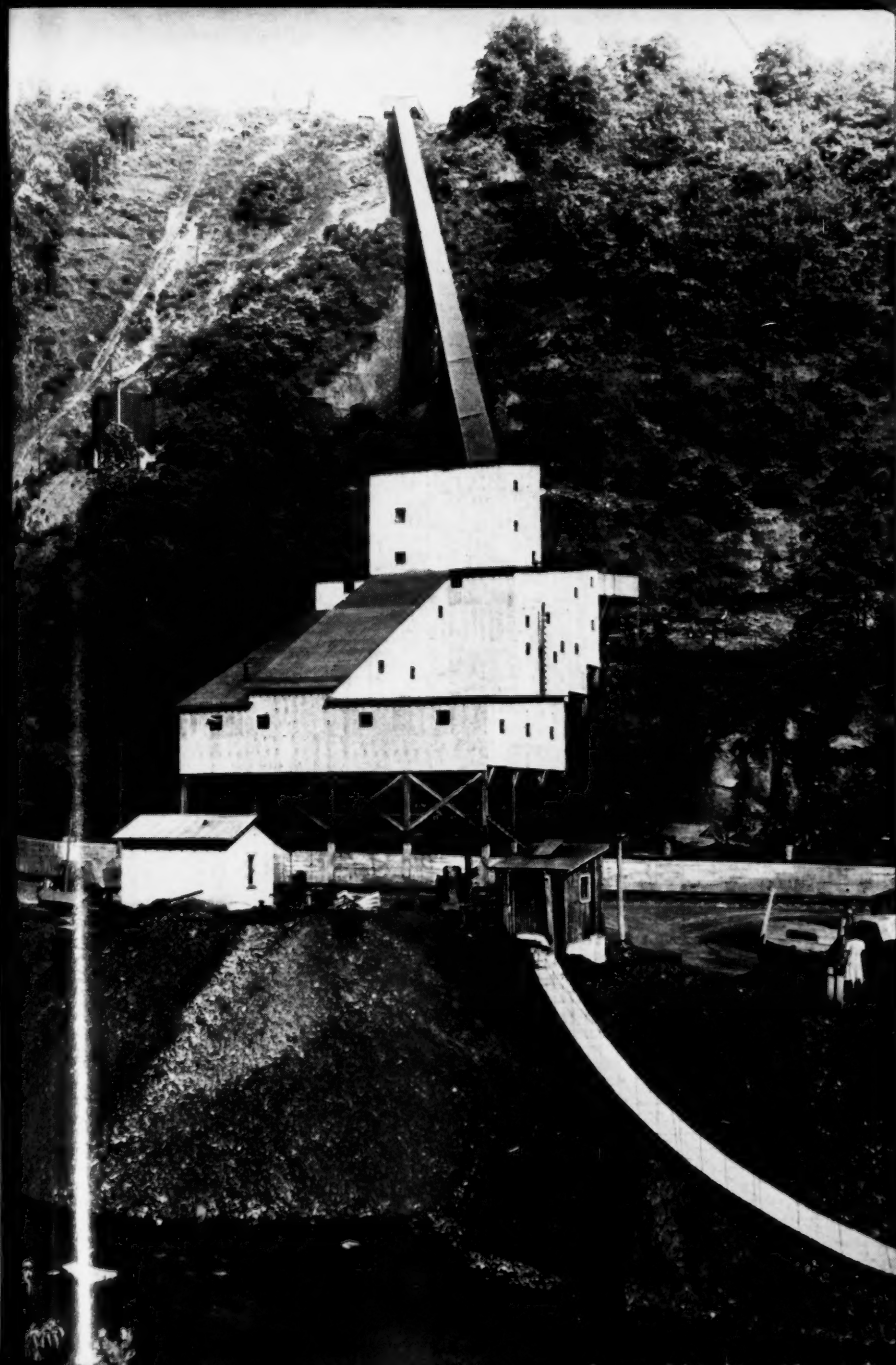


SEPTEMBER
1942

COAL AGE

McGraw-Hill Publishing Company, Inc.

Price 35 Cents



MODERN METHODS USED
In Esco 10 Mining and Preparation

•
GETTING MORE MINE AIR
With a Lower Power Consumption

•
DRY ICE CALLED UPON
To Complete Fire Extinguishment

•
MEN, METHODS AND SHOPS
Mark Castle Gate Maintenance Work

•
CAN IT BE USED AGAIN?
Theme of Pittsburgh Coal Salvage

•
TANDEM SCRAPERS URGED
For Higher Semi-Longwall Efficiency

•
Complete Table of Contents, P. 5

Esco No. 10 preparation plant and four-track tipple. In the rear is the 906-ft.-long rope-and-button conveyor from the headhouse and 500-ton storage bin on the mountain.

Cure for a "Listless" Loader



SUN MINE LUBRICANTS

Cut Clutch Cleaning Time 96%



Loaders and cutters were plagued with clutch trouble due to faulty lubrication . . . and production was the sufferer. Shutdowns of machines for cleaning of clutches occurred every two weeks.

Then a switch to Sun Mine Lubricants was made . . . and production was given a new lease on life. Trouble has been eliminated . . . clutches require cleaning only once a year . . . and the cost of lubrication cut 25%.

That's a typical report of a Sun Oil Engineer — one of those Doctors of Industry who are

constantly working shoulder to shoulder with mine superintendents to help boost production from seam to chute. Day in . . . day out, Sun Engineering service and Sun Mine Lubricants are working as a team to reduce power drag . . . step up efficiency . . . and increase production.

Whatever your production problem Sun's Doctors of Industry and Sun Products always stand ready . . . willing . . . and able to help you and your mine. Call them in today. Write

SUN OIL COMPANY • Philadelphia
Sponsors of the Sunoco News Voice of the Air—Lowell Thomas



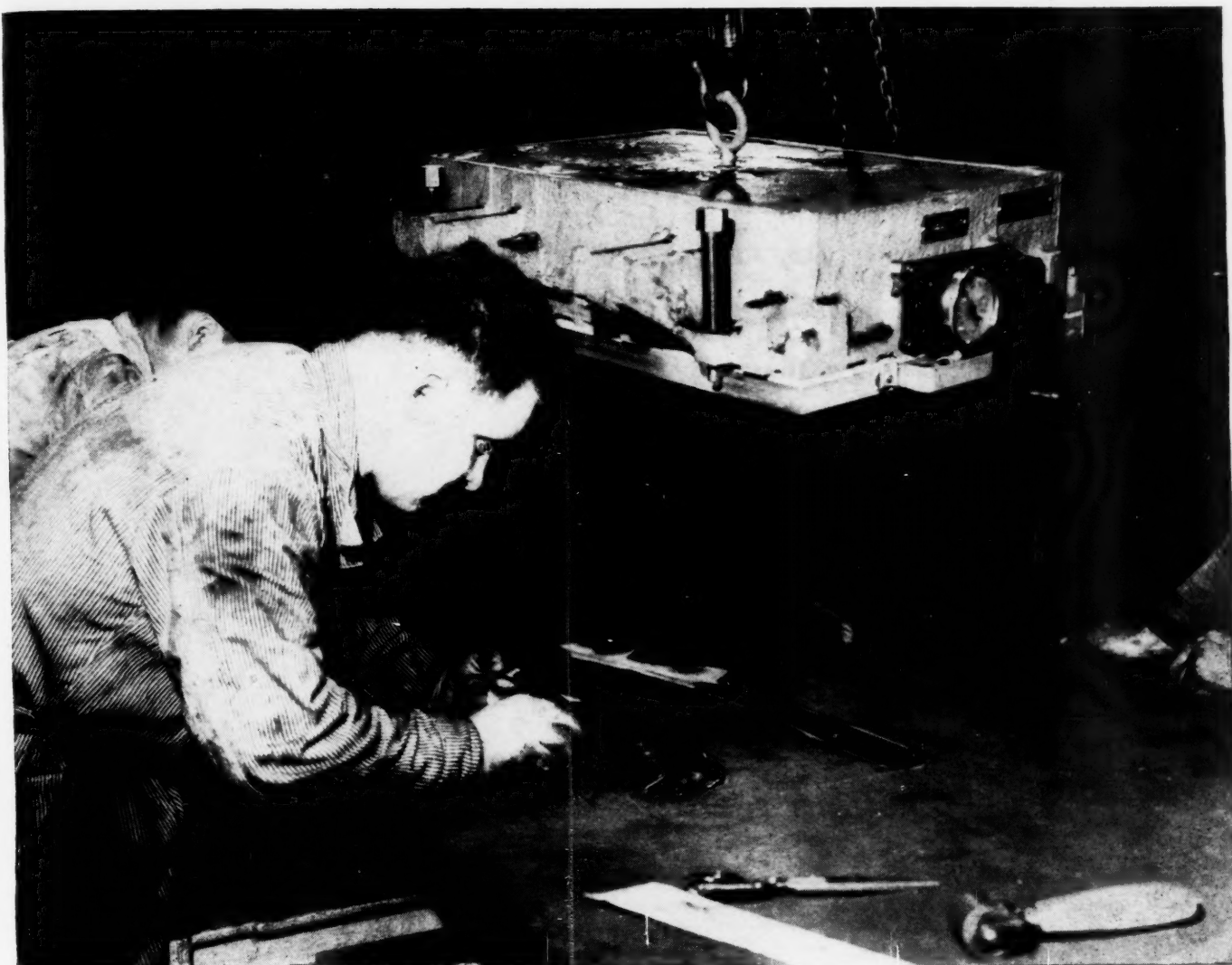
SUN MINE LUBRICANTS

include:

SUN Pressure Grease
SUN Compressor Oils
SUN Journal Oils
SUN Mine Car Lubricants
SUN Ball & Roller
Bearing Greases



SUN PETROLEUM PRODUCTS.. HELPING INDUSTRY HELP AMERICA



"Condemned" belt carried 3 million tons, saved 7900 lbs. of rubber and \$3400

Another B. F. Goodrich suggestion to save rubber

THE man in the picture demonstrates how an injured conveyor belt is made ready for a vulcanized repair. One such belt which had been condemned as hopelessly damaged was repaired this way and since carried 3,808,000 tons . . . 7,900 pounds of rubber headed for the junk pile were saved and put back to work in industry . . . the belt owner saved more than \$3,400.

That is the kind of result many belt users can expect from the B. F. Goodrich conservation program for rubber conveyor and transmission belts—a program that may help you save money, conserve rubber, and perhaps find belts in *your own plant* that priorities won't let you buy.

Years ago B. F. Goodrich developed

the Plylock splice for making conveyor and transmission belts endless—often doubling life of belts where metal fasteners had been used. This splice is vulcanized by a portable electric vulcanizer so that the belt can be made endless in your plant or on the drive if desired.

Repairs in belts can be made by this same B. F. Goodrich method—the damaged plies are cut away, down to the good plies, rubberized repair fabric is cemented in, and the patch vulcanized. That's what was done with the "condemned" belt—50 cuts and gouges were repaired, and the belt lasted 17 months.

Old, worn belts made into new

Many old belts, so worn and frayed as to seem useless, can be saved by this B. F.

Goodrich development. Frayed edges can be trimmed off, worn top or bottom plies can be peeled off. If the belt is then too narrow or light for the original drive, it can be slit into two or more belts for narrower drives. These new-belts-from-old can then be made endless by the Plylock splice. Hundreds of such re-made belts are serving perfectly in plants today.

Most B. F. Goodrich distributors are thoroughly trained by years of experience to give you the benefits and savings of the Plylock method. Call the one nearest you, or write us. We'll send you, too, on request, a series of folders on how to conserve all industrial rubber goods in your plant and, if you are a user of conveyor belts, the Belt Maintenance Manual. *The B. F. Goodrich Co., Industrial Products Division, Akron, Ohio.*

B. F. Goodrich
FIRST IN RUBBER

HULBURT SERVICE N

In peace or war Hulburt service never varies. Users of Hulburt Quality Grease, the only grease made exclusively for coal mine equipment, benefit by the same excellent service now that they did during peacetime. Call your nearest Hulburt Warehouse for Hulburt Quality Service including your down-in-your-mine survey.

HULBURT OIL & GREASE COMPANY

Specialists in Coal Mine Lubrication

PHILADELPHIA . . . PENNSYLVANIA



SERVICE

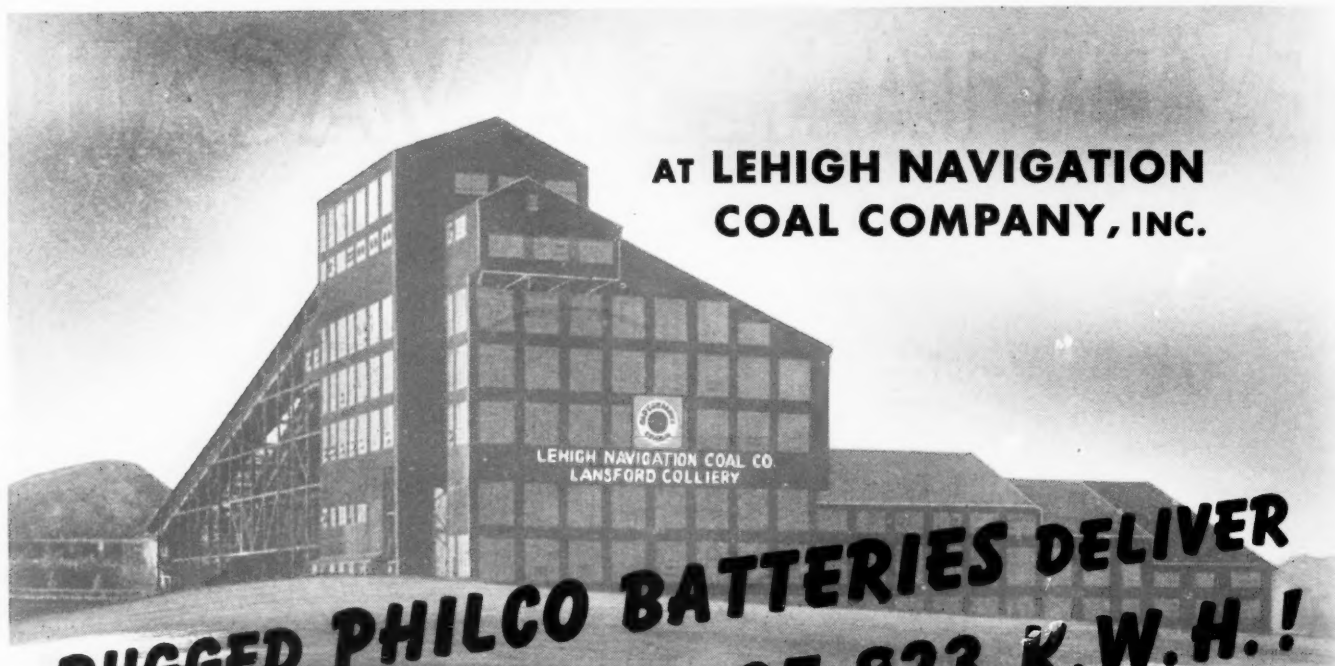
THE ONLY GREASE MADE EXCLUSI

NEVER TAKES A VACATION



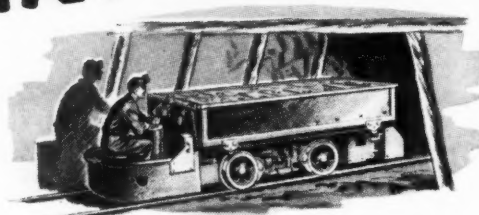
**— PROMPTLY FROM YOUR
NEAREST HULBURT WAREHOUSE**

U SIVELY FOR COAL MINE EQUIPMENT



**AT LEHIGH NAVIGATION
COAL COMPANY, INC.**

**RUGGED PHILCO BATTERIES DELIVER
DAILY CAPACITY OF 823 K.W.H.!**



At "The Old Company's" Panther Valley operations, Heavy Duty Philco Locomotive Batteries deliver a daily capacity of 823 K.W.H. for efficient, economical underground gathering and hauling!

Lehigh Navigation Coal Company's successful operation—plus their 150 years of experience in effective mining methods—proves that battery powered locomotives cut anthracite haulage costs to a minimum, provide maximum efficiency and safety.

In both soft and hard coal fields, Philco XL Storage Batteries keep locomotives and shuttle cars on the jump 10% longer between charges. Philco's extra capacity, long productive life, extra wallop consistently move coal at lower cost per ton. Specify Philco!

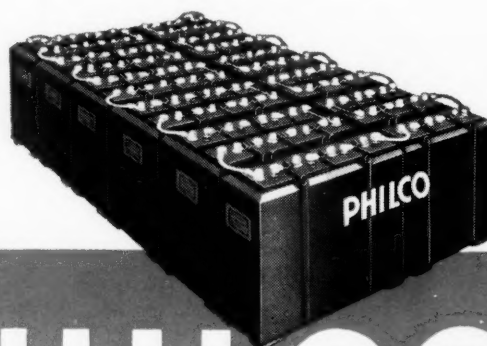
**10% GREATER CAPACITY...SUSTAINED
HIGH VOLTAGE...LONG PRODUCTIVE LIFE**

• Philco oversize grid and Philco engineering give you a positive 10% extra capacity!

• Philco Triple Insulation adds months of dependable service by

"sealing" the active material into the grid.

• Philco "K" Process produces a flint-hard plate of exceptional hardness with a superior bond between material and grid.



Dependable Power for
Mine Locomotives and
for Joy Shuttle Cars



NEW FREE CATALOG
— of Philco Batteries for
Mine use. Write for your
copy, Philco Storage Battery
Division, Trenton, N. J.

PHILCO
Storage Batteries

COAL AGE

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Editorial and executive offices, 330 West 42d St., New York, N. Y. Publication Office, 99-129 North Broadway, Albany, N. Y. Branch offices: 529 North Michigan Ave., Chicago; 68 Post St., San Francisco; Aldwych House, Aldwych, London, W.C. 2; Washington: Philadelphia; Cleveland; Detroit; St. Louis; Boston; Atlanta; Los Angeles.

C O N T E N T S

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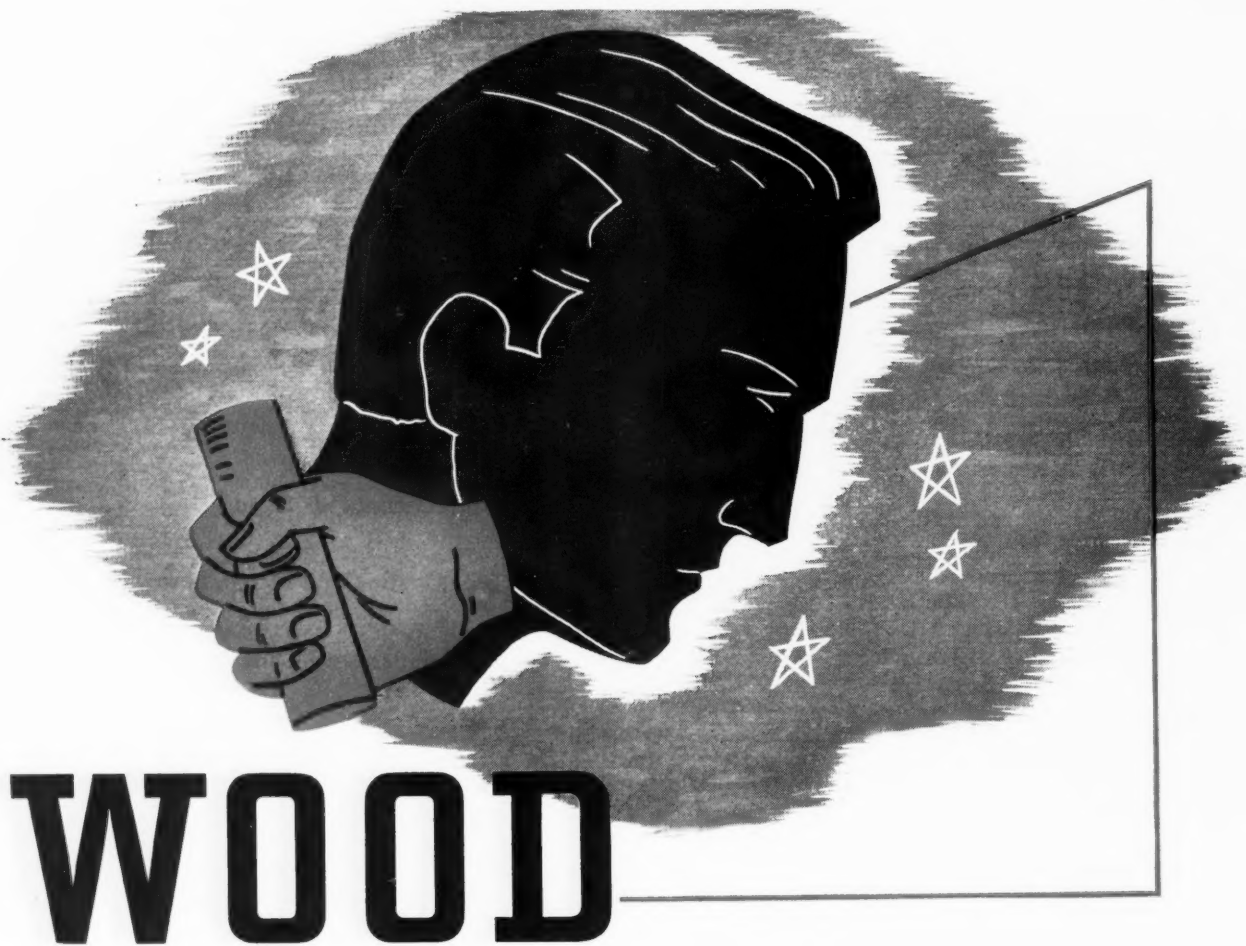
PROGRAM NOTES—COMING ATTRACTIONS

• COAL AGE this month appears in a new format which the editors hope will make reading more convenient and profitable. An outstanding advance is a new and much more legible type face. Feature illustrations are larger and the arrangement of the material, it is hoped, will go far toward making it easier to get to the point. For the latter purpose, a panel summarizing the high spots precedes each feature as well as certain other news and operating articles. With this pre-

amble, therefore, the editors submit the new Coal Age format with the hope that it will enhance the value of its contents for its numerous readers.

• The improvements, of course, will not stop with the appearance of the magazine. What goes in it is, after all, the most important consideration, and the editors are hard at work on a program designed to increase the scope of feature and other material and make it more timely and usable.

Next month, for example, Coal Age will devote its entire feature section to the subject of war-time maintenance at coal mines, both deep and strip. There is little need to dwell on the importance of maintenance in this age of machinery and especially in the present period of increased pressure for production on one side and scarcity of materials and equipment on the other. But it might again be pointed out that the difference between mediocre results and high efficiency may rest eventually on the care with which maintenance is set up and carried on.



A NAME WHICH MEANS "LEADERSHIP THROUGH SPECIALIZATION"



WOOD . . . is producing more and more . . . to win the war more quickly.

The WOOD "BIG FIST" . . . the leading coal shovel in the mines of America.

PRODUCT leadership springs from specialization. It comes from the devoted labor of heads and hands uniting in the day by day production of one product . . . always endeavoring to make that product better and better . . . always insisting that each upward step in quality be maintained in each tool produced. Specialization, such as this, leads constantly to those new ideas which make a product more durable, more efficient, and more useful.

The Wood Shovel and Tool Company has specialized not only in the manufacture of shovels, spades and scoops but also in the creation of improvements in their design and workmanship. New features in these products, first originated and introduced by Wood, have formed milestones in the full modernization of man's most ancient tool of useful labor.

THE WOOD SHOVEL AND TOOL COMPANY
PIQUA, OHIO

A NATIONAL ORGANIZATION SPECIALIZING EXCLUSIVELY IN SHOVELS, SPADES AND SCOOPS

HOW'S BUSINESS

• The October war-maintenance issue will, therefore, discuss the objectives to be achieved in good maintenance, how efficient maintenance organizations may be established and how maintenance work should be done. "How to Do It" will be the major theme of the material.

• Maintenance also figures in the present issue with an article on the work at Castle Gate No. 2 mine in Utah. With preventive measures a large factor in its maintenance work, Castle Gate No. 2 also has materially enlarged its surface shop to take care of its mechanical-mining and auxiliary equipment. For the details of how Castle Gate does it, including organization and maintenance practices, see p. 52 of this issue.

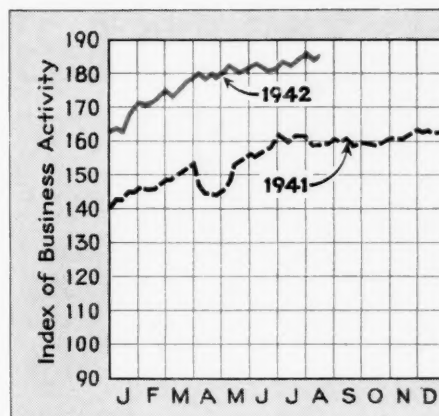
• Salvage these days is an important adjunct to maintenance work. In this issue, therefore, is a short, pithy and well-illustrated article on how salvage work is carried on by the Pittsburgh Coal Co. Can it be used again? is the theme, as R. W. Mackensen aptly states. Therefore, every attempt is made to recondition or sell all salvaged equipment, parts and material. Only after it is clearly unusable or unsalable is it scrapped. This article (p. 56) will repay careful study.

• Mechanical mining and preparation still loom perhaps the largest in the thinking of executives and operating men in the coal-mining industry. For their perusal, Coal Age this month offers a double-barreled article based on the modernization program at the Esco No. 10 mine of the Utilities Elkhorn Coal Co., in eastern Kentucky. Mobile loaders at this property are served by shuttle cars, and car trimmers are not employed at the elevating conveyors. The coal is prepared in a new 250-tons-per-hour plant preceded by a storage bin, picking table and belt and rope-and-button conveyors. The 5x14-in. size is cleaned in an air-pulsated jig and the 4x0 on an air table. All screening is done on vibrating equipment. The article starts on p. 43 of this issue.

• Why not tandem scrapers to increase output in semi-longwall operation? is the theme of another mechanical-mining article in this issue (p. 62), by Robert Carson. Backing up his contentions with suggested plans, Mr. Carson argues the advantages of two scrapers in tandem to raise output from a wall, as well as tandem scrapers on the tail rope and double walls for still higher unit production. Relaying with two scrapers on the same rope is suggested as an alternative.

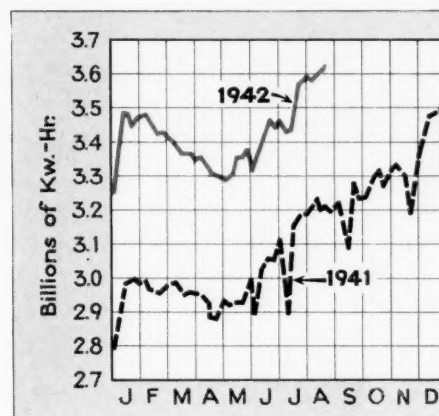
GENERAL BUSINESS CONDITIONS

In an effort to prevent or to recapture excess profits, the War and Navy departments and the Maritime Commission have laid down rules for renegotiation of war contracts, but business, pinched between this plan and excess profits taxes, believes output would rise if proposed levy were cut, according to *Business Week*. WPB's priorities job also would be easier, it is thought. *Business Week* Index was at 184.7 as of Aug. 15, compared with 183.9 a month earlier and 159.5 a year previous.



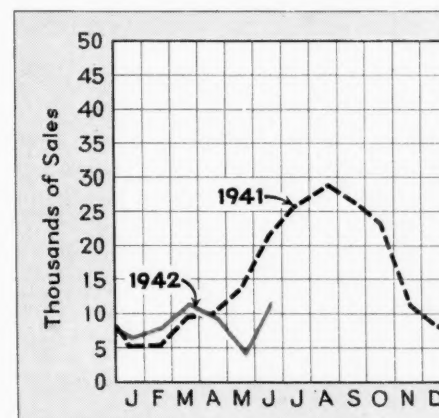
ELECTRIC POWER OUTPUT

Output of electric energy by the electric light and power industry during the week ended Aug. 15, according to the Edison Electric Institute, continued the rate of gain shown in recent weeks with 3,654,795,000 kw.-hr., an increase of 12.9 percent over the corresponding week of last year. The greatest gain—25.5 percent—was in the Pacific Coast region. Figures for other recent weeks are: July 25, 3,626,000,000; Aug. 1, 3,649,000,000; Aug. 8, 3,637,070,000 kw.-hr.



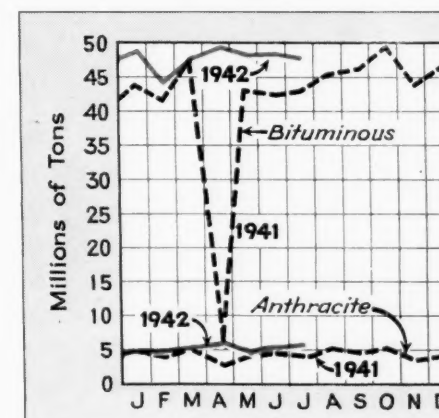
COAL STOKER SALES

Mechanical stoker sales in the United States in June last totaled 11,784 units (U. S. Bureau of the Census from 101 manufacturers), compared with 5,053 in the preceding month and 21,801 in June, 1941. Sales of small units in June last were: Class 1 (under 61 lb. of coal per hour), 10,784 (bituminous, 9,541; anthracite, 1,243); Class 2 (61-100 lb. per hour), 377 (bituminous, 359; anthracite, 18); Class 3 (101-300 lb. per hour), 204.



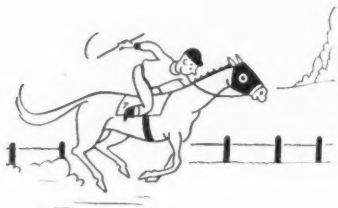
COAL PRODUCTION

Bituminous coal produced by United States mines in July last (preliminary) totaled 47,700,000 net tons, according to the Bituminous Coal Division, U. S. Department of the Interior. This compared with 48,400,000 tons in the preceding month and 44,080,000 tons in July, 1941. Anthracite tonnage in July last, according to the U. S. Bureau of Mines (preliminary), was 5,341,000, as against 5,122,000 (revised) in the preceding month and 4,855,000 tons in July, 1941.



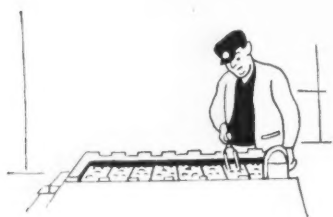
Keeping Peaks Down.

When haulage units are powered by alkaline batteries it isn't necessary to add the haulage load to the hoisting load—the battery charging can be done at off-peak hours. This means a lower maximum demand and a higher utilization of existing distribution lines.



Lean Horses are Popular.

"Give me a lean horse for a long race," was never truer than when applied to gathering and tramping. While Edison Alkaline Batteries weigh the least, they are also the strongest and last the longest. This is not a *claim*. It is a matter of electrochemical principle and structural design. Edison Batteries are the only alkaline batteries made in the U. S. A.

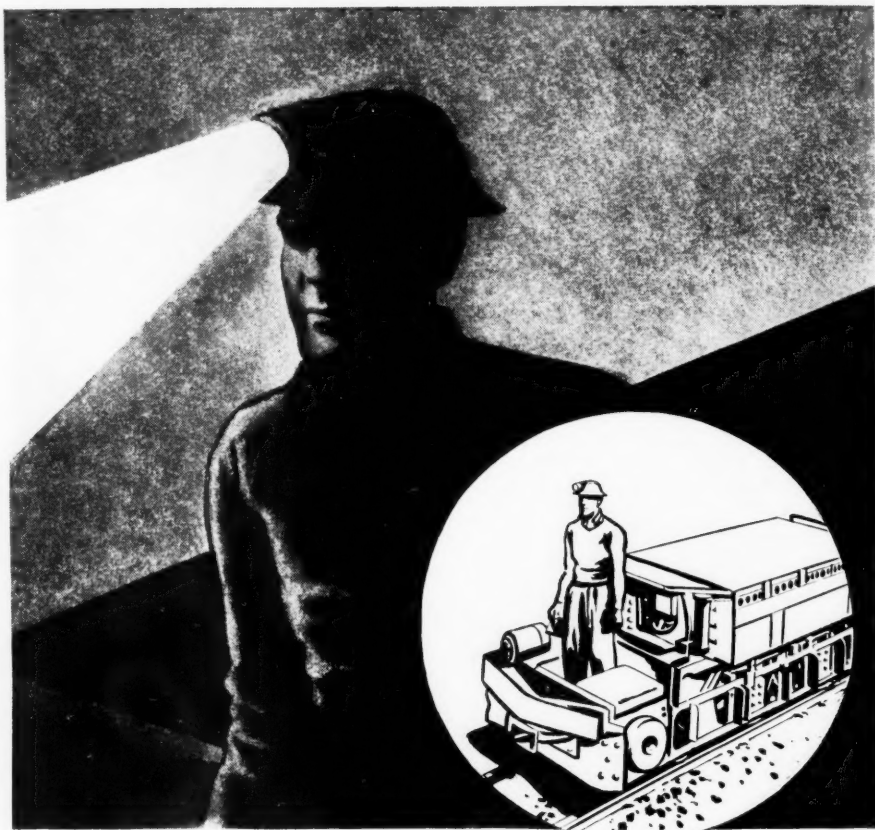


Maintenance Simplified.

Untrained men can do a lot of damage just "learning how." With alkaline batteries, maintenance runs the least risk—they have even been charged in reverse. And, they are as rugged physically as they are electrically—because they are built of steel. In few services do batteries take as much punishment as in mines—reason in itself for preferring steel construction.

Edison Storage Battery Division
Thomas A. Edison, Inc.
WEST ORANGE, N. J.

THIS POWER must not fail



The man in the factory is at the mercy of the man in the mine. If the critical materials don't come through—neither do the tanks and guns. But the industries and mines have an ally in common. The vital material-handling systems of industry are the battery industrial trucks; more than 50% are powered by Edison Alkaline Batteries.

Vital to transportation in mines are the locomotives and shuttle cars—where again the alkaline battery is proving its worth in getting the war

production through. Thomas A. Edison, when he invented the alkaline storage battery, contributed more to winning World War II than even he could have guessed.

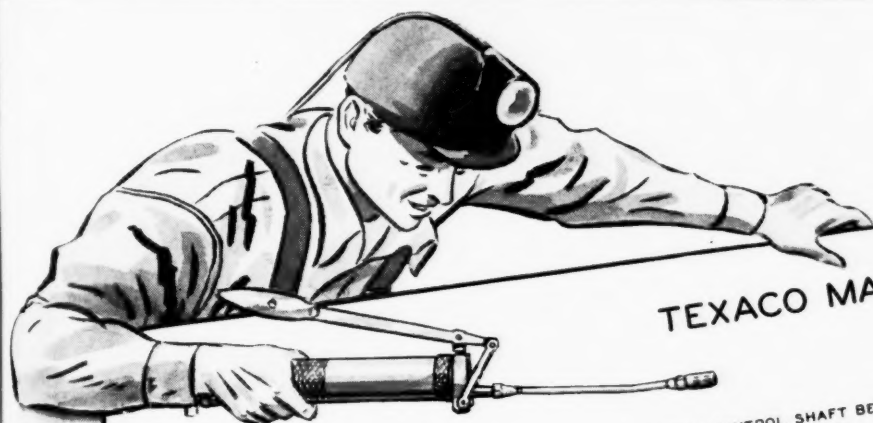
Yes, alkaline batteries are the most dependable portable power the world has ever known. Electrically, chemically, structurally, they are made to order for today's stringent demands. Dependability is the reason for their success in mines, on railroads, throughout industry and aboard ship.

MINING NEEDS THE DEPENDABILITY OF

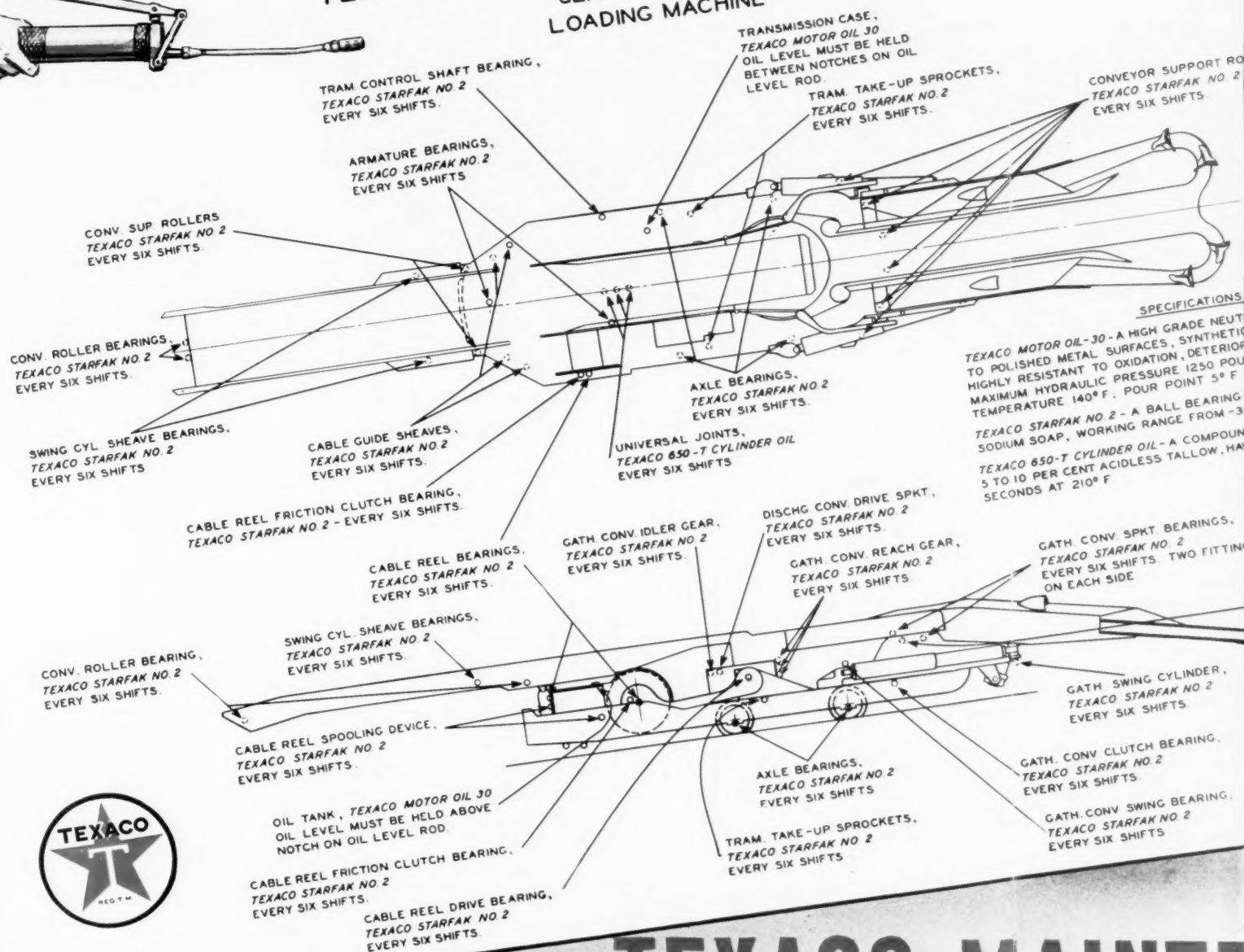
Edison Alkaline BATTERIES

WAR-TIME MAINTENANCE

Prevent Breakdown



TEXACO MAINTENANCE LUBRICATION CHART JEFFREY L-600 LOADING MACHINE



SPECIFICATIONS

TEXACO MOTOR OIL-30 - A HIGH GRADE NEUTRALIZED TO POLISHED METAL SURFACES, SYNTHETICALLY HIGHLY RESISTANT TO OXIDATION, DETERIORATION, MAXIMUM HYDRAULIC PRESSURE 1250 POUNDS PER SQUARE INCH, TEMPERATURE 140° F. POUR POINT 5° F.

TEXACO STARFAK NO. 2 - A BALL BEARING GREASE, SODIUM SOAP, WORKING RANGE FROM -30° F. TO 210° F.

TEXACO 650-T CYLINDER OIL - A COMPOUND OF 5 TO 10 PER CENT ACIDLESS TALLOW, MAXIMUM HYDRAULIC PRESSURE 1250 POUNDS PER SQUARE INCH, TEMPERATURE 140° F. POUR POINT 5° F.

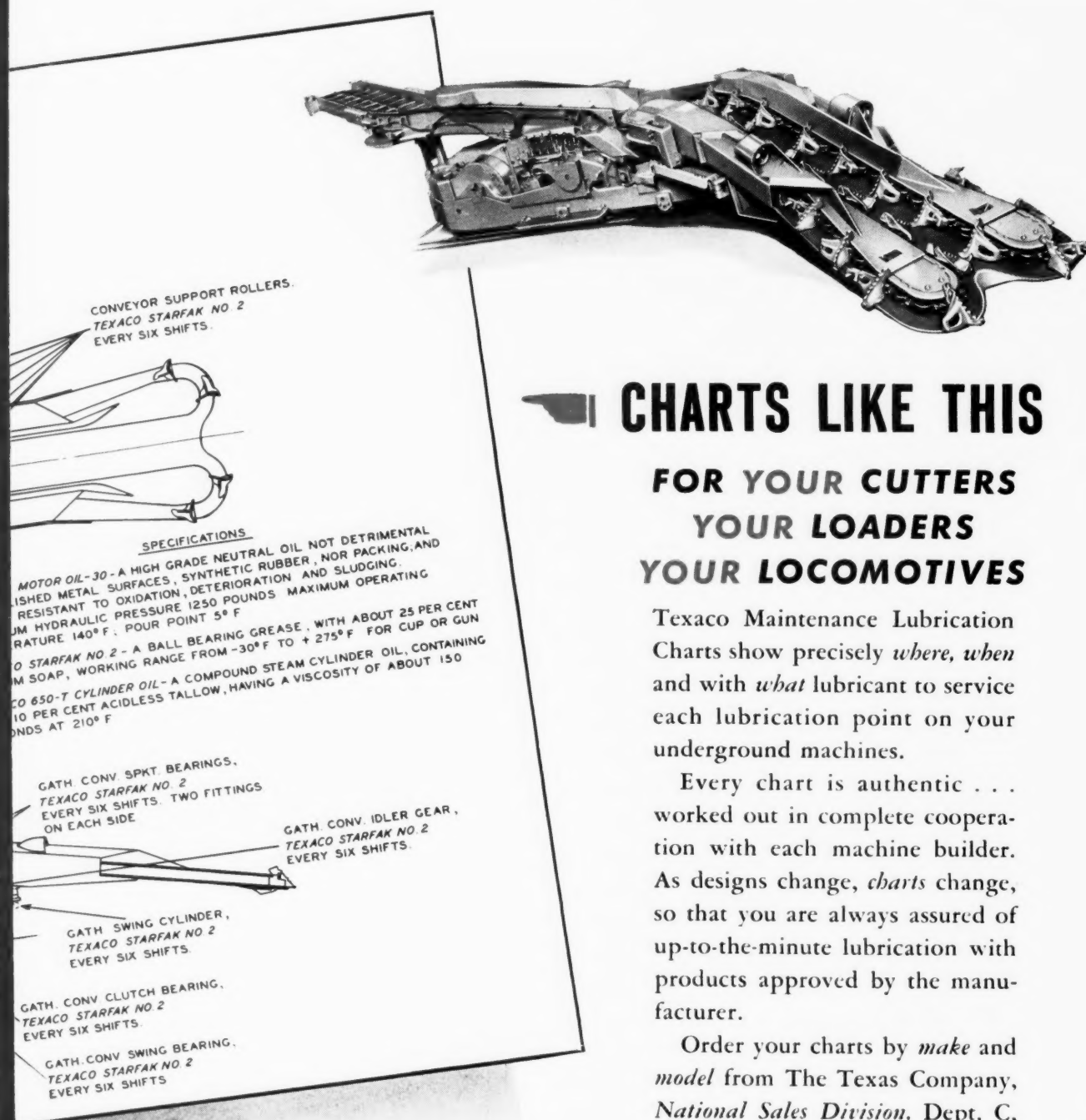


CHARTS FOR UNDERGROUND MACHINERY ARE AVAILABLE

TEXACO MAINTENANCE

MAINTENANCE

breakdowns



CHARTS LIKE THIS

**FOR YOUR CUTTERS
YOUR LOADERS**

YOUR LOCOMOTIVES

Texaco Maintenance Lubrication Charts show precisely *where*, *when* and with *what* lubricant to service each lubrication point on your underground machines.

Every chart is authentic . . . worked out in complete cooperation with each machine builder. As designs change, *charts* change, so that you are always assured of up-to-the-minute lubrication with products approved by the manufacturer.

Order your charts by *make* and *model* from The Texas Company, National Sales Division, Dept. C, 135 E. 42nd St., New York, N. Y.

MAINTENANCE LUBRICATION

FOR THE COAL MINING INDUSTRY



Washington Press Photo

"To keep war production going full blast, we need to mine more coal this year than ever before. We need at least 11 million tons of bituminous coal every week—and so far this year we have fallen short of that goal seven times. For the entire year the nation will require about 572 million tons of bituminous and 55 million tons of anthracite."

— Excerpt from recorded talk by Dr. Wilbur A. Nelson, Administrator of Mining Branch, War Production Board, before Pittsburgh Coal Co.'s employees, Pittsburgh, Pa., June 20, 1942.



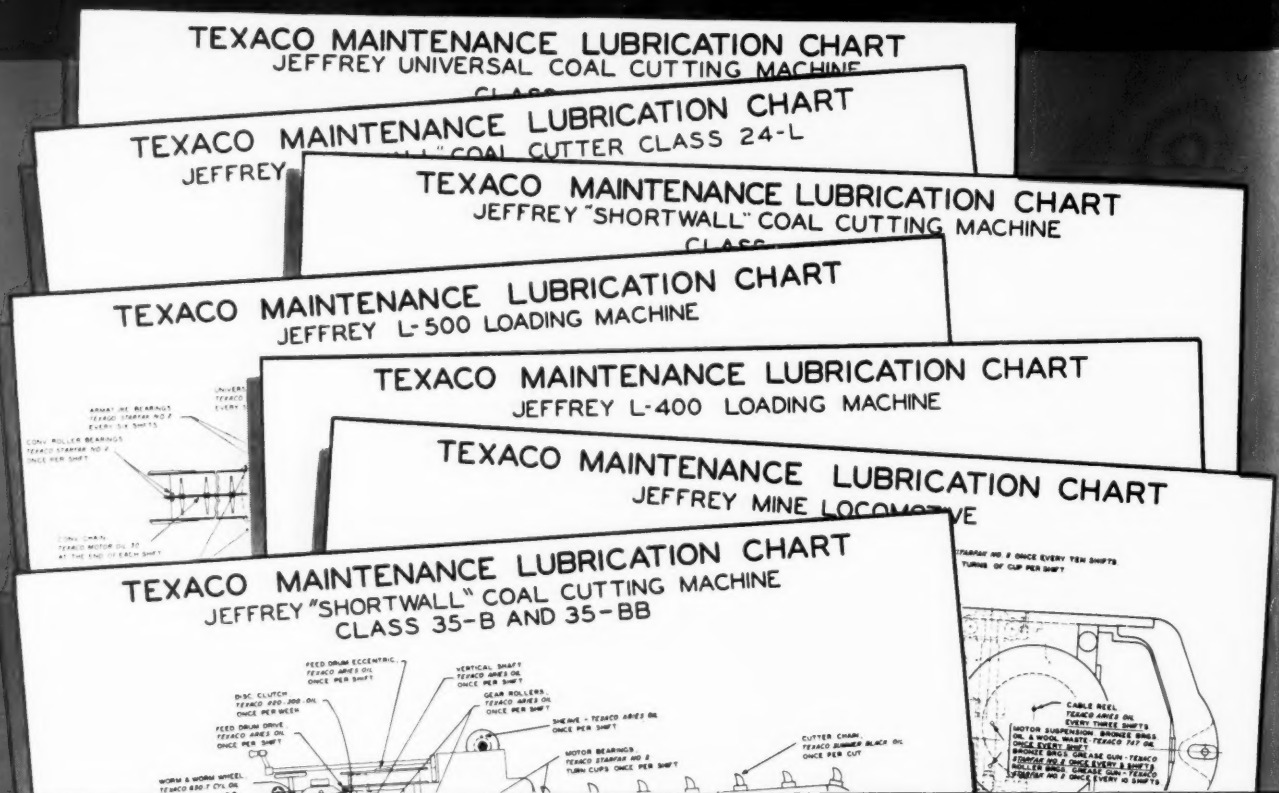
WPB's Coal Demand can be met only by keeping EVERY MACHINE ON THE JOB

On the inside of this 4-page announcement, The Texas Company presents another of its series of maintenance lubrication charts to assist the coal industry in achieving WPB's requirements.

LOOK INSIDE THIS 4-PAGE ANNOUNCEMENT

TEXACO MAINTENANCE LUBRICATION CHARTS

ARE AVAILABLE FOR ALL MAKES OF UNDERGROUND MACHINES



ALL TEXACO Maintenance Lubrication Charts are 12" x 18" in size, for easy visibility when tacked up at each lubrication station.

Using Texaco you get same high quality as enjoyed by the U. S. Government and the various industries listed in the panel.

Send for the charts you need, specifying make and model. In this simple way assure yourself of maximum service and less time out for repairs. Address:

The Texas Company, *National Sales Division*, Dept. C, 135 E. 42nd St., New York, N. Y.

THEY PREFER TEXACO

- ★ More locomotives and cars in the U.S. are lubricated with Texaco than with any other brand.
- ★ More buses, more bus lines and more bus-miles are lubricated with Texaco than with any other brand.
- ★ More stationary Diesel horsepower in the U. S. is lubricated with Texaco than with any other brand.
- ★ More Diesel horsepower on streamlined trains in the U. S. is lubricated with Texaco than with all other brands combined.
- ★ More revenue airline miles in the U. S. are flown with Texaco than with any other brand.

THE TEXAS



COMPANY

Wanted urgently: STEEL SCRAP

Shortage of steel scrap is threatening the war-production program.

If ships, planes, tanks and guns are to be produced in the volume needed to win the war, the country's steel-making facilities must operate at full capacity. But the plain truth is that the steel scrap to support continued capacity operations is not available, and not in sight.

United Effort Will Do the Job

Thanks to the construction of new blast furnaces, the deficiency is being partly made up by using more pig iron in steel-making. But tremendous quantities of additional scrap must be found within the crucial next few months.

Actually, many thousands of tons of steel scrap are potentially available *if only they can be gathered in*. This scrap, needed so urgently in the war effort, is scattered through the industrial plants, mines and railways, the farms and the homes of the nation. The problem is to col-

lect it and get it moving to the steel mills. Everyone must help. If everyone will, there will be scrap to meet the needs of the war-production program.

Make a checkup in your plant or warehouse, or any other property you own or manage, and in your home.

Have any odds and ends of steel or iron that may be lying around collected. If you have any obsolete or idle equipment, machinery, or parts—anything that's made of iron or steel and isn't really needed—junk it, and get the scrap moving toward the steel mills.

How to Put Your Scrap to Work

Some iron or steel now lying rusting and forgotten around your property may help to save the lives of Americans in the battle areas. Gather up every possible bit of iron and steel scrap. Sell it to a local junk dealer, or get in touch with your local scrap salvage committee. Put your scrap to work for your country. It's needed, now!

BETHLEHEM STEEL COMPANY





An Abnormal Problem Gets a Normal Solution

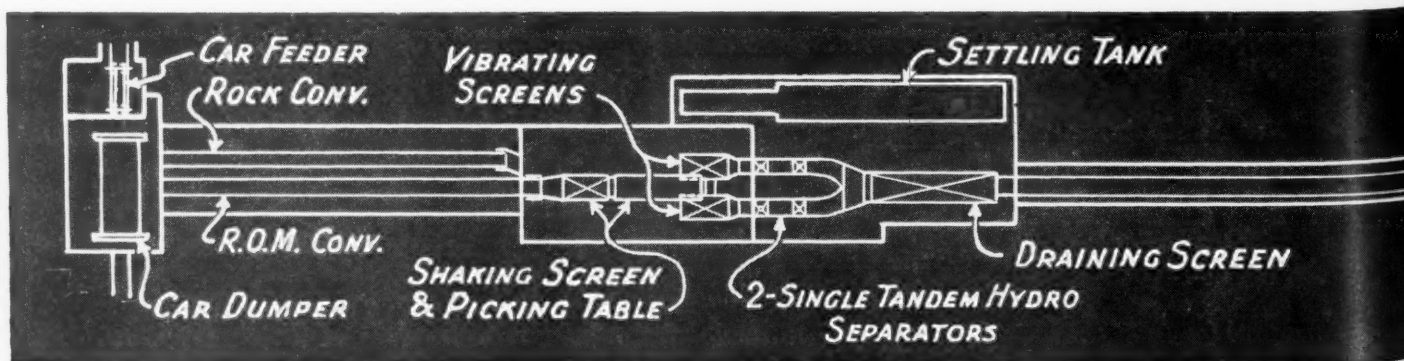
THE Duquesne-Warwick mine, shown here, delivers coal to barges for a power plant. No rail haul is involved. The problem was to design a river tipple and preparation plant with a capacity of 600 tons per hour which would take maximum advantage of local conditions.

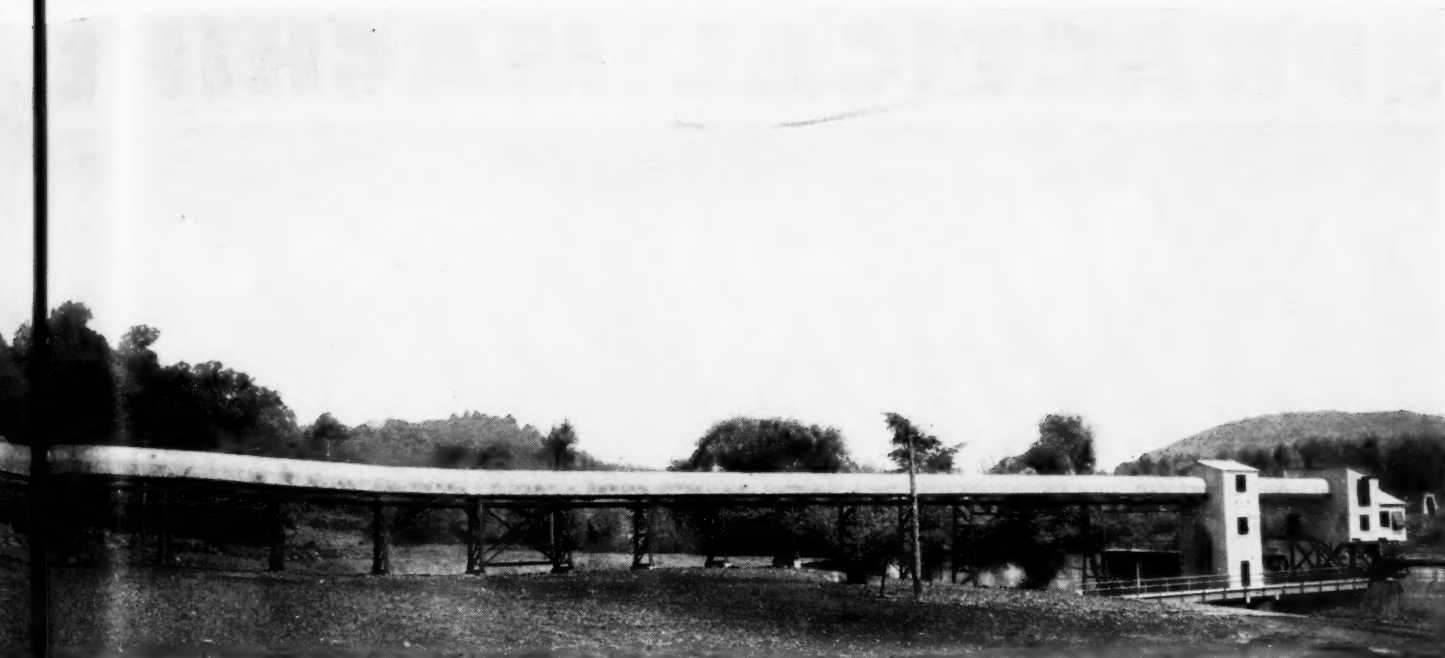
The manner in which the Roberts and Schaefer organization solved the problem is obvious from the picture. Without recourse to special methods or special equipment, the fullest possible advantage was taken of the natural and local

features of the mine and its location. The results are evident.

The output of the mine is hand picked and crushed to 5 inch. Screening divides it into 5x1" and 1x0" sizes. The larger size is washed in Tandem-Launder Hydro-Separators and the smaller size is bypassed. The two sizes are re-assembled and delivered by a belt conveyor direct to barges.

Every mine owner has unusual problems. His local conditions are different from most other mines. The value of the results he gets will de-





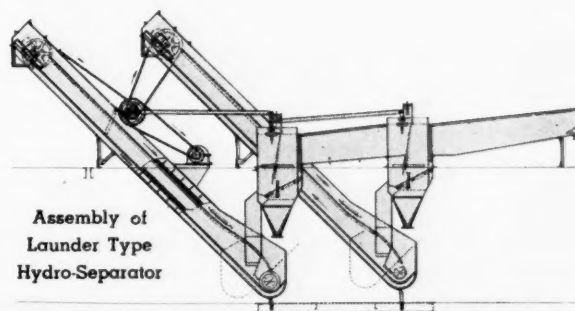
pend on how well he takes advantage of these conditions and adapts his plant to them.

The Roberts and Schaefer organization has definite advantages to offer in the development of a plant. Years of experience with large and small mines, and with mines in a huge variety of conditions has given R & S the accumulated experience that is necessary to make the most of a given situation.

Because we manufacture equipment for all kinds of cleaning processes, wet, dry or in combination, coal mine operators can be certain that our recommendations will be free from prejudice, and that the methods and

equipment selected will be those that long experience shows are best suited to local conditions and markets.

We shall appreciate the privilege of consultation on your problems.



Assembly of
Launder Type
Hydro-Separator

ROBERTS and SCHAEFER CO.

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PITTSBURGH, PA.

2017 "S" Street, N. W.
WASHINGTON, D. C.

P. O. Box 570
HUNTINGTON, W. VA.

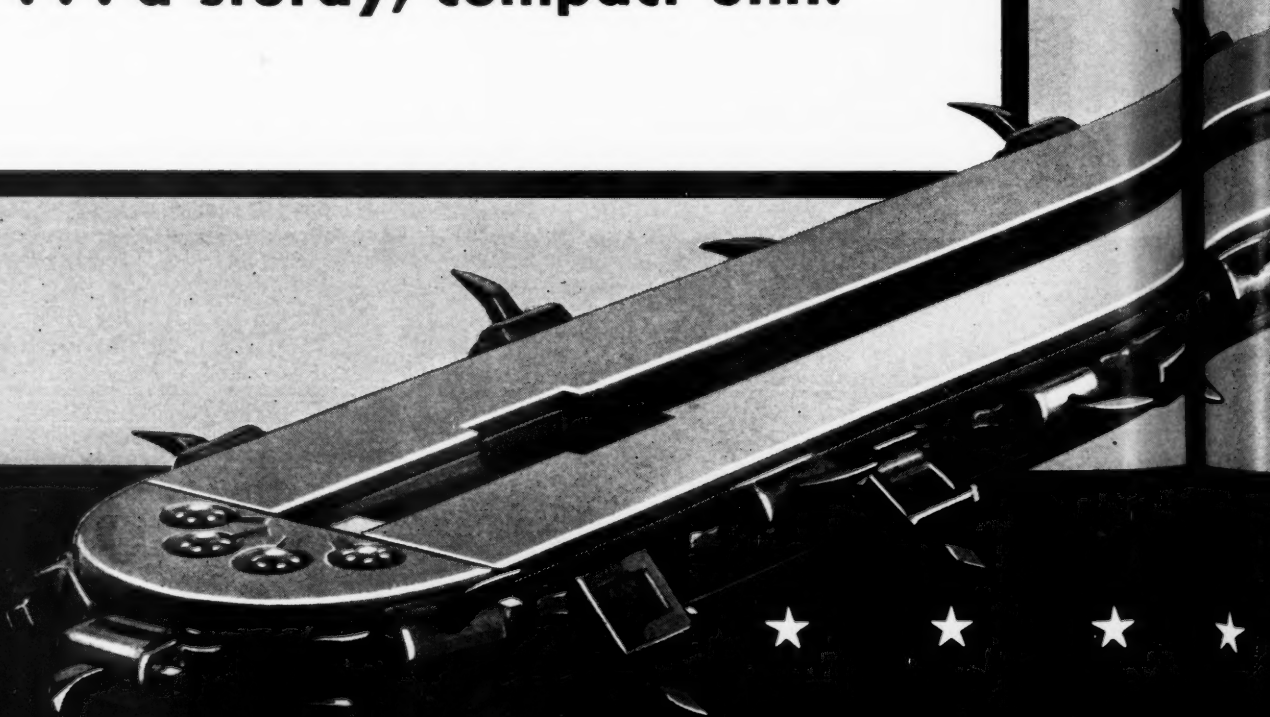
BELT CONVEYOR

Scale 1" = 45'-0"

A PRACTICAL MACHINE FOR

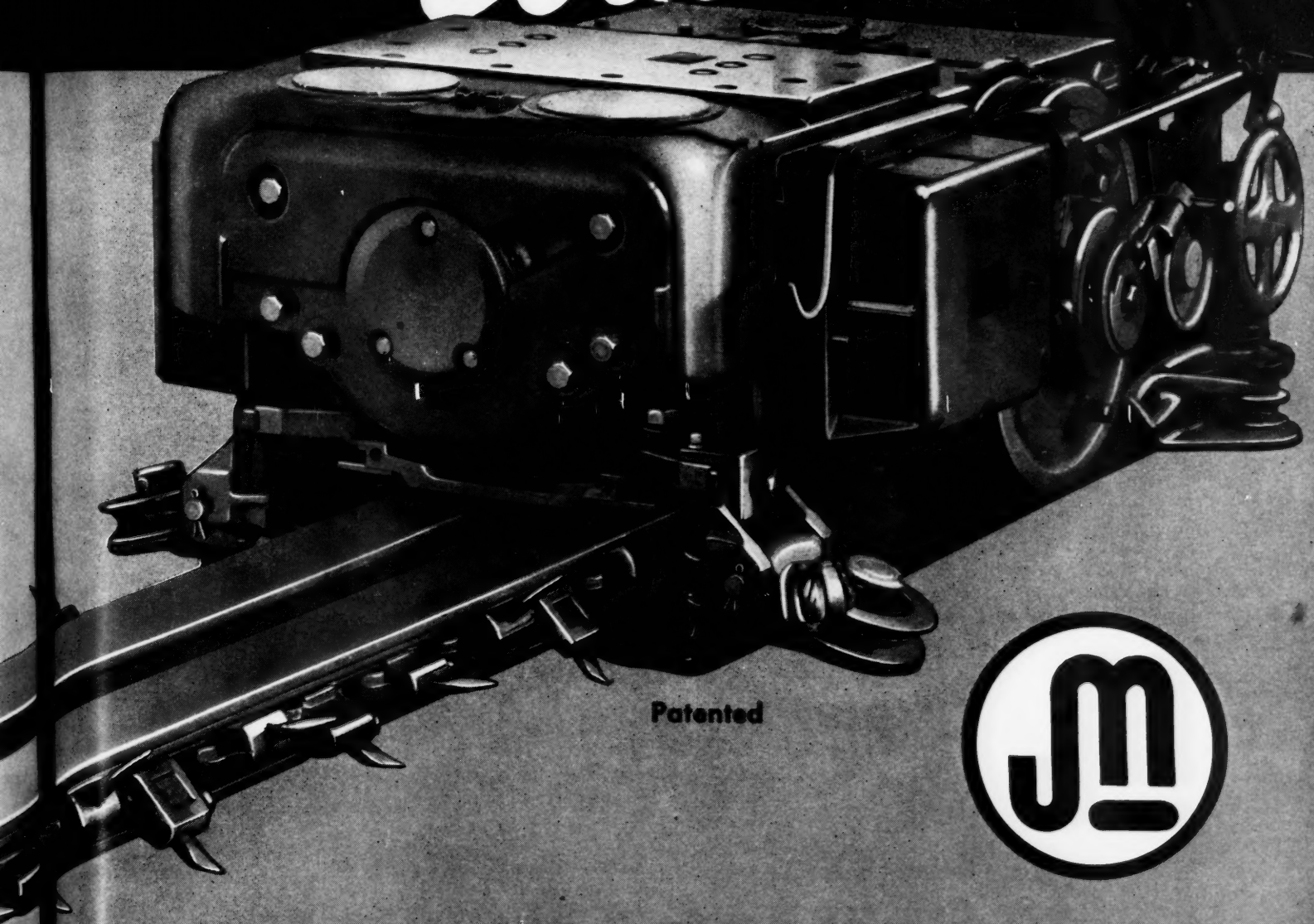
Jeffrey 35-B

**The Jeffrey 35-B Shortwall
has gained a wide accep-
tance for long life and low
maintenance. Simple in
design and construction
... a sturdy, compact unit.**



E FOR THE JOB REQUIRED

Shortwall Coal Cutter



Patented



THE JEFFREY MANUFACTURING COMPANY

912-99 North Fourth Street • Columbus, Ohio

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BALTIMORE
BIRMINGHAM
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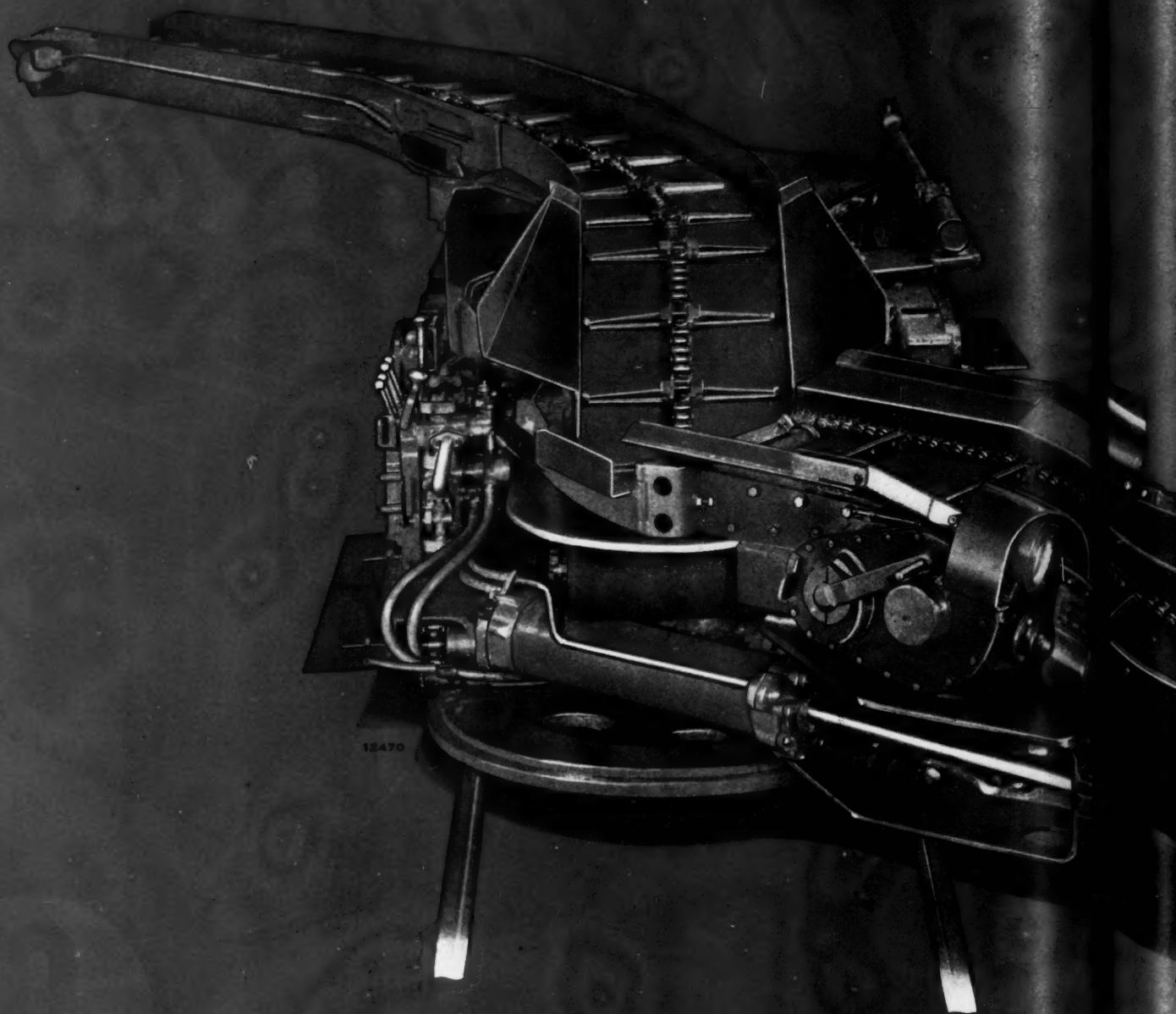
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Service Stations: PITTSBURGH • HARLAN, KY. • BIRMINGHAM • ST. LOUIS • LOGAN-BECKLEY, W. VA. • SALT LAKE CITY • SCRANTON

The GOODMAN 48

Limits Operating Delays At



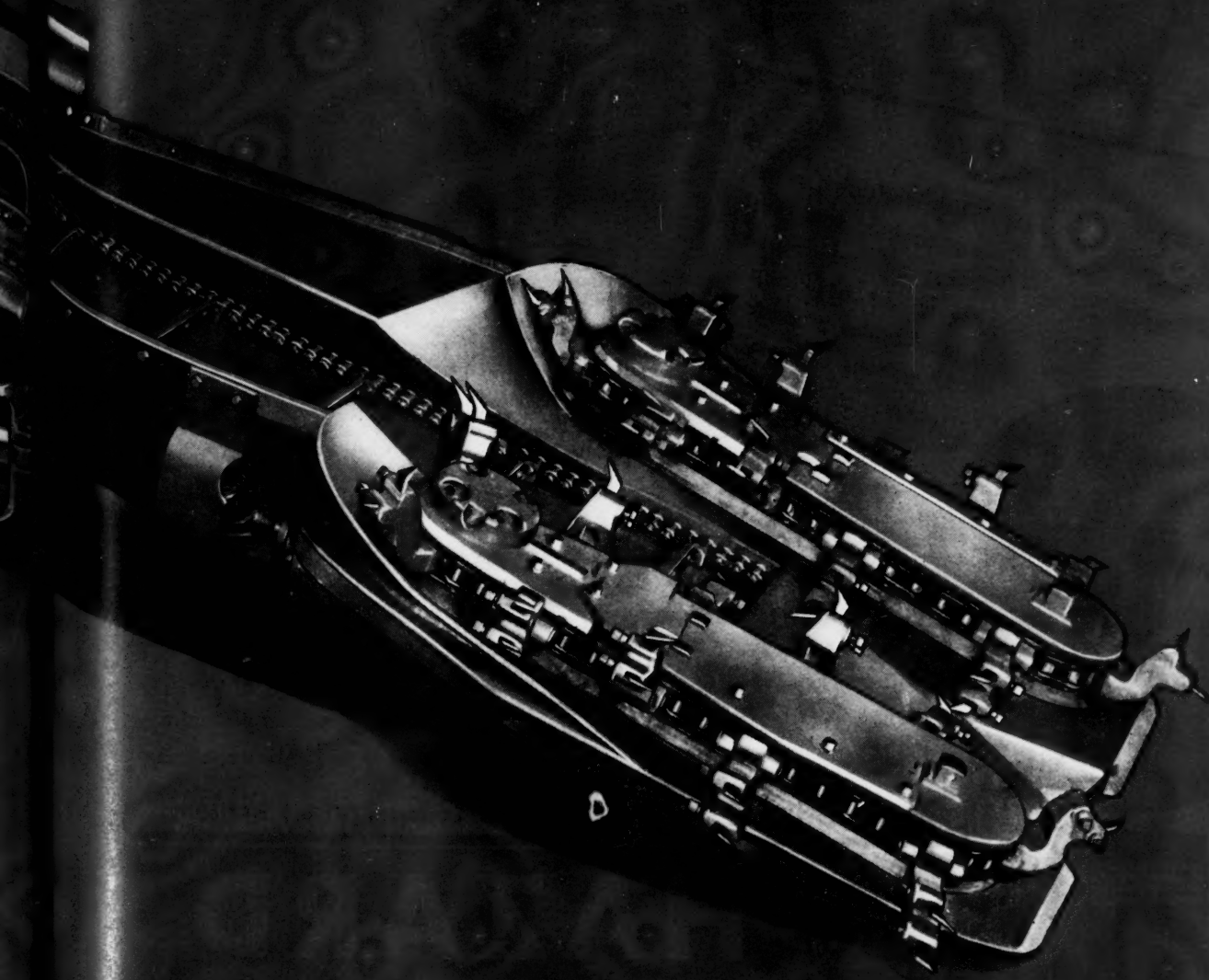
GOODMAN MANUFACTURING COMPANY

HA

N 460 LOADER

Assures Maximum Tonnage

The *Goodyear 460* is a powerful, easily maneuvered, high capacity loader that loads not only from straight track but on sharp curves and in short spotting.



HALSTED STREET AT 48TH • CHICAGO, ILLINOIS

Be Kind to Your Portable Cables

THEY ARE DIFFICULT TO REPLACE!

1

Don't use your cables as towing ropes—this stretches the conductors, cuts down carrying capacity and pulls insulation loose.



Keep gathering reels in proper working order so that cables will not be injured by runovers, jams and jerks.

2



3

When lubricating mine equipment, see that stray oil and grease is wiped off insulated cables promptly. Oil softens and swells rubber.



There are more do's, don't's and how's to prolong the life of Hazacord mining cords and cables. Ask our representative to tell you about them.

HAZARD INSULATED WIRE WORKS

DIVISION OF THE OKONITE COMPANY
Works: Wilkes-Barre, Pennsylvania
Offices in Principal Cities

"BUY U. S. WAR BONDS... Every Payday All Hazard Employees BUY U. S. WAR BONDS"



HAZARD

Electrical Cables for Mining Use



How can you beat it?

THE VERY FIRST MACK ever built stayed in service for 17 years. The ninth Mack, built in 1901, is still in running condition, although retired after a million miles of service. Right now, 7 of every 10 Mack trucks built 10 years ago are still on the job. How can you beat a record like that? Where else can you find trucks equal to these? The answer's simple — *you can't!* From one ton to forty-five tons, a Mack is your *best* truck in the end because a Mack is *more* truck to begin with!

Mack Trucks, Inc., Long Island City, N. Y.

*Plants at Allentown, Pa., New Brunswick, N. J., Plainfield, N. J.;
Factory branches and dealers in all principal cities for service and parts.*

(Midnight on the Albany Post Road, as the big Mack, "Honeygirl," rolls back onto the job out of an all night eatery. Sketched from life by Peter Helck.)

Mack

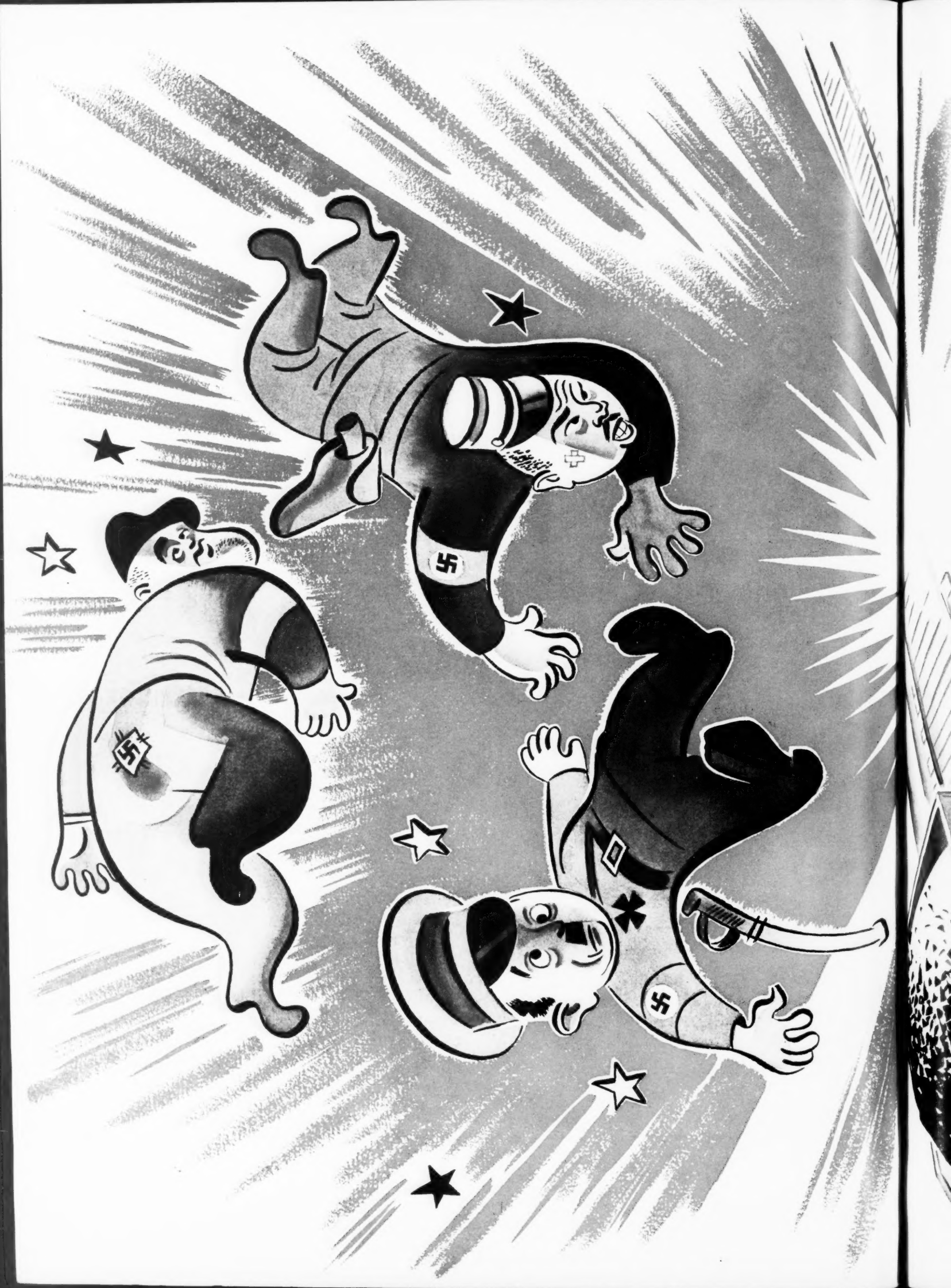
TRUCKS

FOR EVERY PURPOSE

ONE TON TO FORTY-FIVE TONS

BUY U. S. WAR BONDS

IF YOU'VE GOT A MACK, YOU'RE LUCKY... IF YOU PLAN TO GET ONE, YOU'RE WISE!



VICTORY STARTS ROLLING.

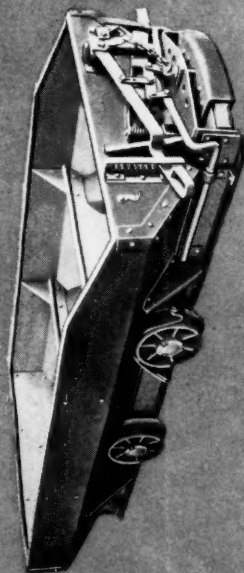
In the MINE CARS of America!

Mine cars roll up with the coal . . . mine cars roll out with the ore . . . mine cars roll endlessly between vein-breast and tippie, that factory, foundry, furnace, and forge may continue to pour out their overwhelming flood of the weapons of war. Never before were mine cars so important. Never before such vital need of their continuous, uninterrupted service.

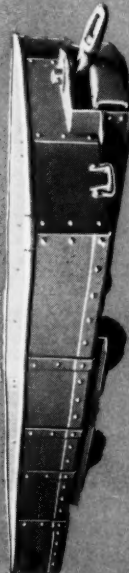
And nothing short of the best possible

mine car equipment can adequately meet the critical needs of the hour. Q.C.F., the country's largest builder of mine cars, is meeting this demand with the full force of its engineering and manufacturing energies. Call upon Q.C.F. for wheels . . . axles . . . repair parts . . . new trucks . . . complete mine cars. No order is too small—or, subject to priorities, too large. At any rate you can count on Q.C.F. to help you keep 'em rolling!

Q.C.F. Chilled Tread Mine Car Wheels, as manufactured under our heat-treating process, are made from a special mixture of metals — better for mine car wheels than steel or iron, alone.



LARGE CAPACITY AUTOMATIC DROP BOTTOM CAR



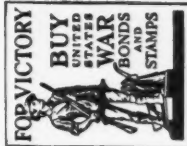
FOUR-AXLE CAR FOR ROTARY DUMP



CAR FOR ROTARY DUMP

AMERICAN CAR AND FOUNDRY COMPANY

NEW YORK • ST. LOUIS • CHICAGO • PHILADELPHIA • BERWICK, PA. • PITTSBURGH • CLEVELAND • HUNTINGTON, W. VA.



2-CYCLE DIESEL

*It's Husky!
It's Sturdy!
It's Tough!*

It's the most outstanding Diesel in the mining industry, this hard-hitting, double-powered, 2-cycle engine. It "packs a real wallop" that carries it through the toughest going — it gets in there and lugs where ordinary engines stall—and



it keeps on purring along without constant nursing and attention, a full sixty minute hour . . . 24 hours per day . . . if necessary.

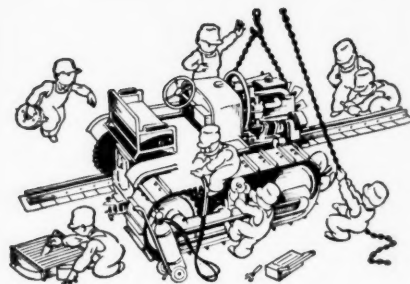
Service records indicate thousands of hours of operation without overhauls or major repairs on tough, three shift jobs. That's the kind of service Allis-Chalmers tractor owners are getting from their 2-Cycle Diesels. It's the kind of performance that gets jobs finished on time and at less cost — the kind of performance you've always wanted in a tractor engine — the kind of performance only a 2-Cycle Diesel can give you.

If you are not already a 2-Cycle Diesel owner, it will pay you to check up on this modern power. Be prepared for the future. Write for complete information.

ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE • U. S. A.

2-Cycle
THE MODERN
DIESEL POWER

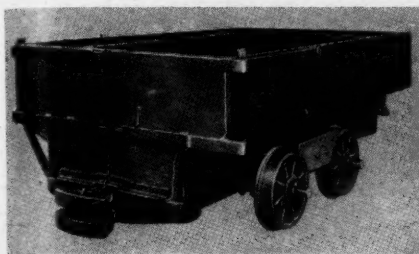
COMPLETE RECONDITIONING SERVICE!



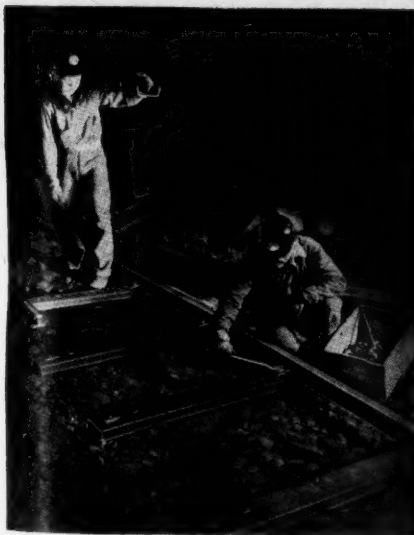
You can add hundreds of working hours to the life of your old machines by letting your Allis-Chalmers dealer repair or rebuild them. He has the right tools, the skill and service facilities to do an A-1 job.

**"Now we're mighty glad
that we equipped with
STEEL!"**

U-S-S ROOM TIMBERS AND POSTS pay for themselves by allowing 50 to 75% greater production in each cut. Their longer spans give plenty of space for operating cutting machines at full capacity. And they are safe, too—will bend but not break.



U-S-S MINE CARS of almost every conceivable type are built to meet individual requirements as to the height of coal seams, mining methods, track gauges, etc. Our engineers specialize in designing cars for maximum capacity within dimensional limits.



U-S-S STEEL TIES assure safe, rapid movement of heavy equipment. Their shallow depth increases headroom and permits larger loads. Ties are easy to lay, without trenching. Whole sections of track can be moved from room to room.



IN these days of headlong production, many a mine operator is thanking his lucky stars that his management were farsighted enough to outfit their properties with steel. No other material is so widely adaptable to high-speed, mechanized production methods.

Steel room timbers and posts increase output, because their greater strength permits a wider working area, with complete safety. The elimination of intermediate pit posts makes mechanical mining easier. Because steel timbers have less depth, headroom is greater and car capacity is increased. Heavy equipment rolls swiftly and

safely over trackwork laid on steel ties.

Steel's first cost is almost the only cost. For permanent structures, it cuts replacements to a minimum and requires little maintenance. Steel timbers, posts and ties can be re-used time and again—and have high scrap value when finally worn out.

The use of steel for mining is drastically limited by war. But the very qualities that make steel our most important fighting material today — its strength and endurance, its versatility and economy — are the qualities that will answer the needs of modern mining tomorrow.

CARNEGIE-ILLINOIS STEEL CORPORATION

Pittsburgh and Chicago

Columbia Steel Company, San Francisco, *Pacific Coast Distributors*
United States Steel Export Company, New York

UNITED STATES STEEL

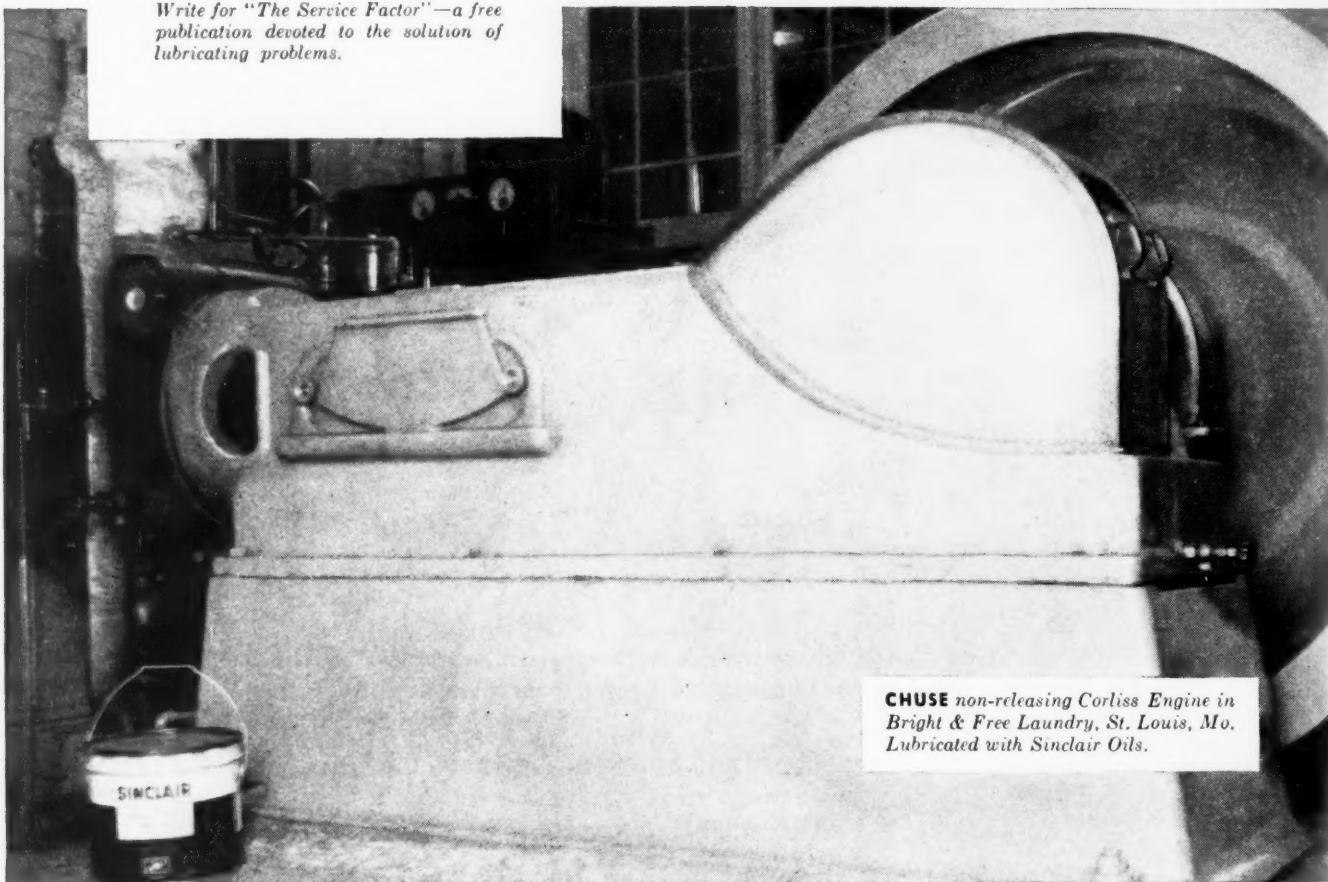
FRONT LINE MIGHT

rests on rear line power.
STEAM ENGINES deliver
full designed horsepower
when lubricated with . . .

...SINCLAIR STEAM CYLINDER and VALVE

OILS. These oils provide
correct steam plant lubrica-
tion and meet all steam re-
covery requirements.

Write for "The Service Factor"—a free
publication devoted to the solution of
lubricating problems.



CHUSE non-releasing Corliss Engine in
Bright & Free Laundry, St. Louis, Mo.
Lubricated with Sinclair Oils.

SINCLAIR INDUSTRIAL OILS

FOR FULL INFORMATION OR LUBRICATION COUNSEL WRITE NEAREST SINCLAIR OFFICE
SINCLAIR REFINING COMPANY (Inc.)

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10 WEST 51ST STREET
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ATLANTA

FAIR BUILDING
FT. WORTH

CARDOX

"THE NON-EXPLOSIVE MINING METHOD"

Enables You to Get More Out of
Available Men and Machines

**Cardox
Simplifies War-Time
Shipping and Storage
Problems by
Preserving Coal
Structure**

● CARDOX has definitely established itself not only as the safest practical method of breaking down coal, but also as a big saver of manpower and a means of getting the most out of available mechanized equipment.

Because CARDOX rolls out the coal for easy loading, mechanical loaders accomplish more in less time . . . require less time out for maintenance and repairs . . . require fewer replacement parts.

Equally important, CARDOX-mined coal ships and stores better because it is not weakened by shatter-cracks. Reserve stock piles of even the most friable coal can be accumulated, if dislodged by the gentle heaving action of CARDOX.

Proof of these CARDOX advantages is yours for the asking. Write for booklet giving full details.

**Write or Wire Today for a Free Test
Demonstration at Your Mine**

Note how CARDOX rolls out the coal for easy loading. This saves time, labor, and reduces wear and tear on loader.

CARDOX CORPORATION • BELL BUILDING • CHICAGO

Greater Safety

Always Important—Imperative Today!

ANYTHING that increases the effectiveness of America's production machine is vital today.

That's why the extra margin of safety provided by Atlas Manasite Detonators is more valuable than ever. By helping reduce avoidable accidents, Atlas Manasite Detonators help keep up production. They play a definite part in the cooperative effort needed to meet today's demands.

In addition to the safety factor, Atlas Manasite Detonators offer full dependability. The proof is in the figures: millions of Atlas Manasite Detonators have already been used. Furthermore, Atlas Manasite Detonators require no special methods of application—no special equipment. Nor do they cost any more.

Can you afford *not* to take advantage of this development for safer blasting practice?

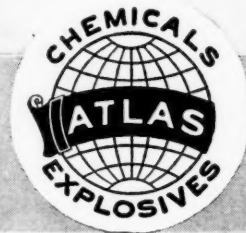
ATLAS MANASITE DETONATORS

for **GREATER
SAFETY**

MANASITE—Reg. U.S. Pat. Off.

ATLAS

EXPLOSIVES
"Everything for Blasting"



ATLAS POWDER COMPANY, Wilmington, Del. • Offices in principal cities • Cable Address—Atpowco

By the Hundreds AMERICA'S LARGEST PLANTS

ADOPT G.T.M. INDUSTRIAL RUBBER CONSERVATION PLAN

Key executives acclaim Goodyear-developed procedure that can prolong life of rubber products as much as 50%. Get your plant started now. No charge.

IN a few short weeks the Goodyear Rubber Products Conservation Plan has become American industry's first line of defense against the rubber shortage.

More than a thousand top operating men from major manufacturing companies have enthusiastically endorsed the plan, at meetings held, in fifty cities from coast to coast, by the G.T.M. — Goodyear Technical Man.

So impressed have they been by its rubber-saving possibilities, many asked the G.T.M. to come into their plants and explain the program in detail to the mechanical staffs. Upwards of 200 of these individual plant meetings have now been held, and many more are scheduled.

That is the verdict of industry on the Goodyear plan — a practical program for conserving your now almost irreplaceable rubber products and prolonging their life many extra months.

AVAILABLE TO ALL

The Goodyear conservation program consists of three simple, easy-to-follow steps:

"Goodyear Wages War on Waste" — a graphic, educational slide film which illustrates to your men, plainly and clearly, recommended conservation practices.

Practical plant demonstrations by the G.T.M. — what to look for, how

to inspect and what measures to take to give hose, belts and other products longer life.

"Goodyear Industrial Rubber Products Conservation" manual — a fully illustrated 40-page book, telling exactly how to make repairs, and filled with suggestions for saving rubber — left with your operating men for their guidance.

HOW TO GET THE PROGRAM

To have the G.T.M. hold a rubber conservation meeting at your plant, simply write us today, and

With this 40-page manual, "Goodyear Industrial Rubber Products Conservation," your men have complete instructions for salvaging rubber products. It's furnished free—to designated operating men.

a definite date will be set. There is no charge for this service; it is not necessary that you be a Goodyear customer — it is all part of Goodyear's effort to help the nation save rubber. To arrange for your meeting, or obtain copy of the manual, write: Goodyear, Industrial Conservation Dept. E-1, Akron, Ohio.

THE GREATEST NAME IN RUBBER

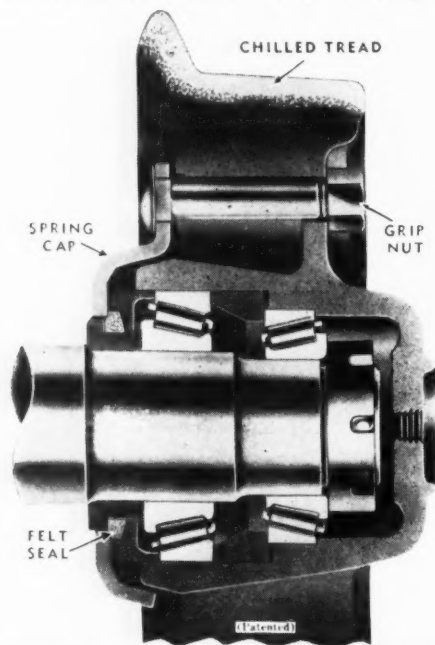
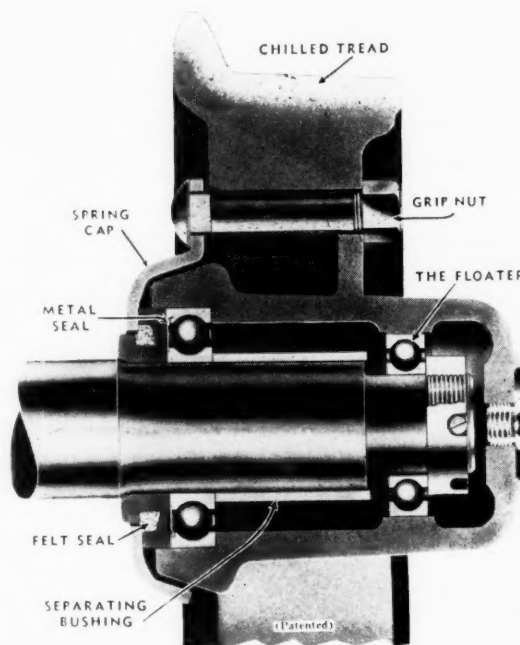




Never Before, During Our 40 Years and Services Been so Vital to the Industry

We manufacture many products, and, more than ever, we are determined to furnish you with the best, the fastest, the most modern, cost reducing haulage equipment available. From repair wheels to cars, you can depend upon us.

THE S-D "FLOATER" . . . the wheel we like to sell because it has so many worthwhile advantages for service and economy. Actual on-the-job-tests prove that S-D "Floaters" permit an increase in locomotive pulling capacity of almost 49%, compared with wheels using other types of precision bearings. Then, compare your present grease and labor of greasing costs with our guarantee that you will not have to grease "Floaters" more than once in 5 years. And, with "Floaters" guaranteed against breakage or bearing failures for 5 years . . . with their quick demountability, no future adjustment of bearings . . . and, with our **FREE TRIAL OFFER**, what more could you ask in order to justify your trying them?

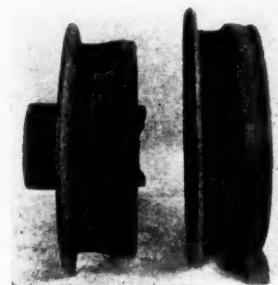


S-D'S NEW TIMKEN BEARING WHEEL

At Last . . . a perfected demountable one-piece wheel equipped with rugged Timken Roller Bearings. This new S-D Wheel has a solid front hub. Bearings are adjusted on the axle first, then wheel is put on and nuts on the retaining bolts are pulled up as tight as possible without injury to the bearings in any way.

REPAIR OR REPLACEMENT WHEELS

Every month, we build hundreds of replacement wheels of every description. Shown at right are samples of ordinary soft wheels such as we receive right along to be replaced by wheels produced through our patented annealing process. And remember this, we are prepared to furnish you with extra **CAR BUMPERS, DRAWBARS, AXLE BOXINGS, AXLES, SHEAVES AND ROLLERS**. Send us your repair wheel orders and start reducing your replacement and maintenance costs **NOW!**

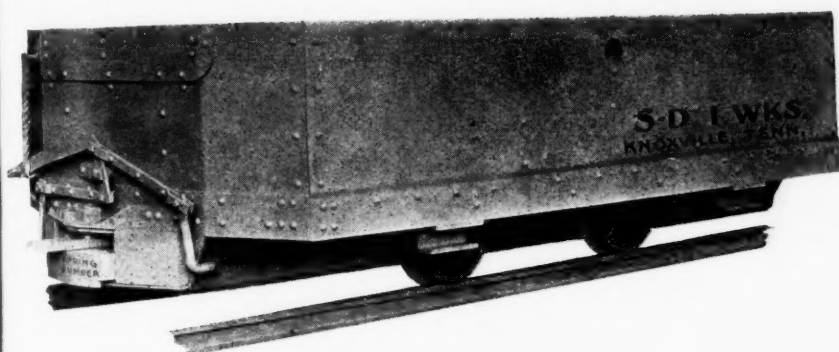
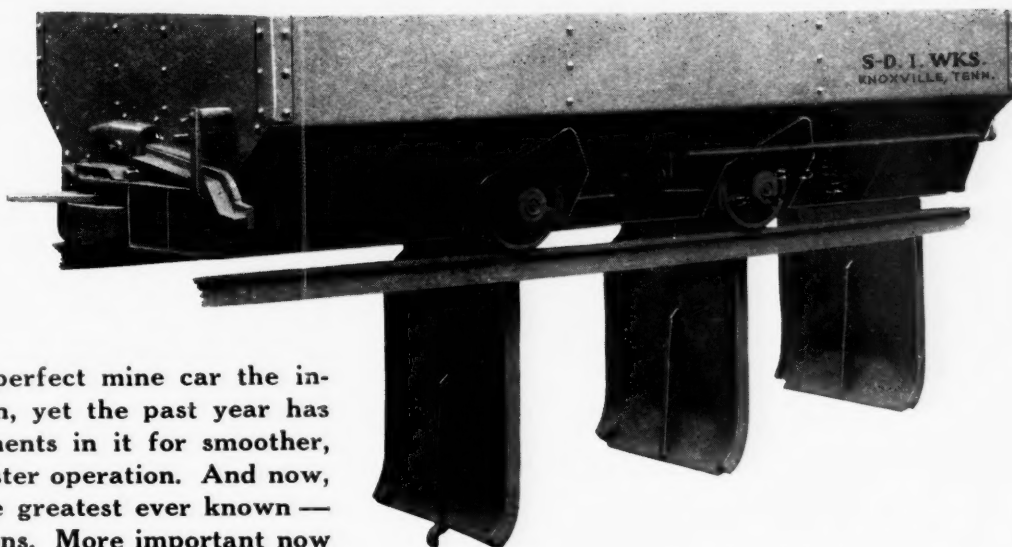


Sanford-Day Iron Works, KNOXVILLE, TENNESSEE

40 Years, Have Our Many Products to the Mining Industry.

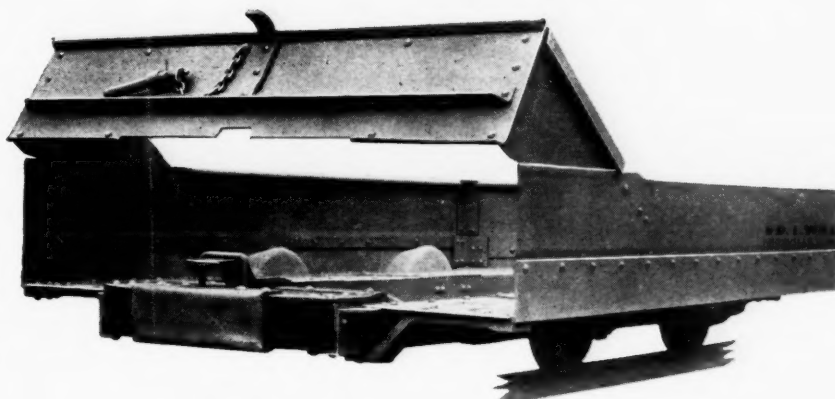
THE S-D 1-2-3 "AUTOMATIC"

As always, the most perfect mine car the industry has ever known, yet the past year has seen several improvements in it for smoother, more foolproof and faster operation. And now, greater capacity — the greatest ever known — for any given dimensions. More important now than ever is the saving in coal breakage. No car has ever been able to discharge coal so easily and gently as the S-D 1-2-3 "Automatic". We strongly advise its use because of its big savings over any other car now available.



S-D "WHOPPER" END DUMP CARS

Although many of the old-timer End Dump car installations of all makes have been replaced with S-D "Automatics", there still are some operations where End Dump cars are required. If this is your case, remember that no End Dump car approaches the simplicity, strength, ruggedness and long life of the S-D "Whopper". Heavy structural steel side truss members easily support the heaviest load without sagging. They are attached to the rugged cross cantilever members at the body corners and run from one end of body to the other. No binders on side to strip off.



S-D "WHOPPER"

ROTARY CARS

S-D Rotary Dump Cars are recognized throughout the industry as the most satisfactory, most modern and sturdiest rotary cars to be had. Their design always affords the greatest possible capacity. They have no binders to strip off against ribs. No unnecessary weight. Easily repaired. Supporting all the weight on the flares are the massive crosswise cantilever structural members at the ends of car body, resting on and attached to the rectangular steel truck frame. Simple! Strong!

Sanford-Day Iron Works, KNOXVILLE, TENNESSEE

THEY

Glide



**OIL IS
AMMUNITION**
USE IT WISELY !

WITH THE GREATEST OF EASE

... IN NORMAL TEMPERATURES OR SUB-ZERO FREEZE

since this mine switched to Tycol Green Cast Greases

Mine cars shuttling back and forth between 60-degree temperatures inside the mine and sub-freezing weather outdoors presented a troublesome lubricating problem. Frequently, after cars stood idle for several days, the grease settled away from the bearings and made starting difficult. "Now with Tycol Green Cast Grease on our cars," reports this mine, "you should see them shoot forward and glide away. We have been using Tycol on our four hundred mine cars with complete satisfaction."

Many other mines once stumped by lubrication difficulties are today enjoying more economical operation and fewer replacement worries since changing to Tycol lubricants. Power and maintenance costs are lower, and in some cases wheel losses have dropped 25%—important today when new equipment is so hard to get. What's the reason for Tycol's outstanding record in mine car lubrication? A higher percentage of fine cylinder oil and low soap content. More cylinder oil—less soap means better, more economical lubrication per pound of grease.

Prepare your equipment now for efficient winter performance and longer operating life. Call a Tide Water lubricating engineer. He will show you how to get the longest service from your mining machinery with least possible wear. Write for full details to Tide Water Associated Oil Company, 17 Battery Place, New York.

DRUMS! DRUMS! DRUMS! DRUMS!

War needs make it extremely important that all empty drums be returned immediately.



TIDE WATER ASSOCIATED OIL COMPANY

EASTERN DIVISION: 17 BATTERY PLACE, NEW YORK

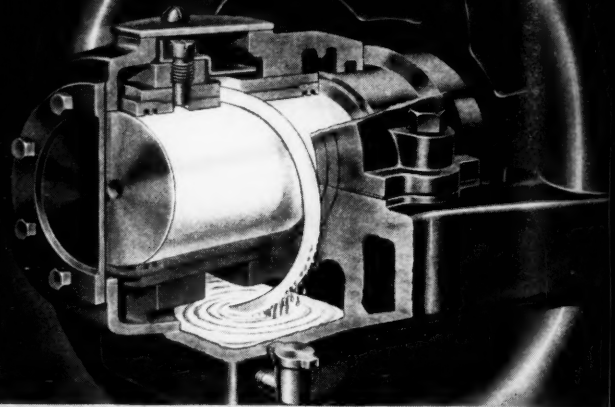
Principal Branch Offices: Boston, Philadelphia, Pittsburgh, Charlotte, N. C.

MAKERS OF THE FAMOUS VEEDOL MOTOR OIL

WHILE YOU'RE WORRYING ABOUT PRODUCTION...

YOU AND YOUR MEN are working hard for production...driving to meet shipping dates. You know your machines are being "driven"—often by "green" help. Wouldn't you welcome aid in making sure *every* machine is properly taken care of with Correct Lubrication?

BEARINGS



LOOKS SIMPLE—but size and type of bearing, speed, heat, load, method of application, all affect the choice of a lubricant. "Correct Lubrication" is a science! It demands skilled experience counsel.

Who's Looking Out

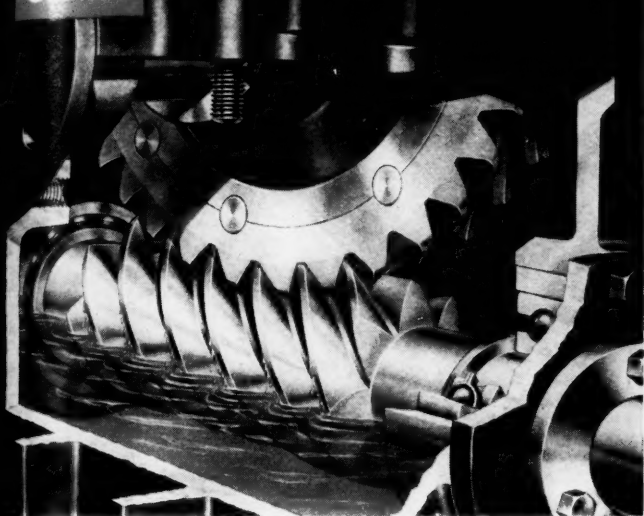
HERE'S A PLAN TAILOR-MADE FOR YOUR PLANT

THOSE TWO STEPS at the right bring you the sum of Socony-Vacuum's 76 years' experience, the world's greatest, in the lubrication field. Today, when there is no time for "second guesses" this knowledge is proving its value in helping industry do its biggest job!



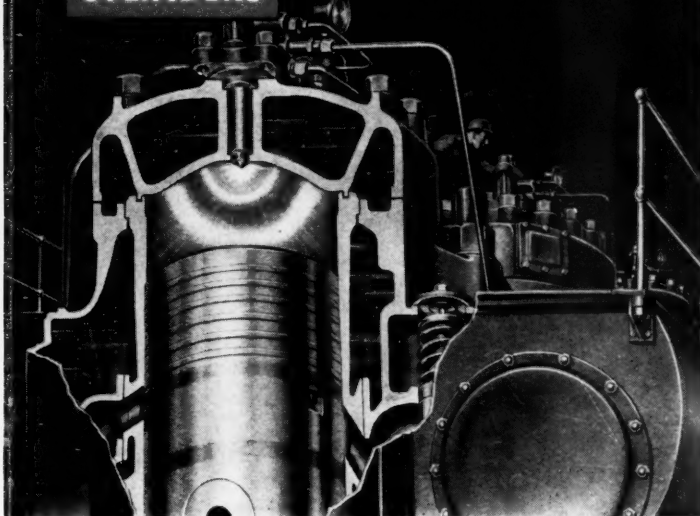
LUBRICATION PLANNING—After careful study of your machines and their operating conditions, your Socony-Vacuum man will work out a guide of lubrication recommendations with your own engineers.

GEARS



IRREPLACEABLE—Precision-made gears, in fact all production equipment, should be viewed as irreplaceable. This places an added burden on lubrication... emphasizes need for only the best!

CYLINDERS



DEPENDABLE POWER—The hum of your power plant is the heartbeat of your production line. Diesels, turbines, steam engines exist on "Correct Lubrication" as prescribed by a lubrication engineer.

for Your Machines?



2 LUBRICATION CONTROL—By means of this lubrication program...through the help of the Socony-Vacuum man...you will be freer to drive for more production. He will gladly help look out for your machines!

TO HELP MAINTAIN WARTIME
PRODUCTION CALL IN

SOCONY-VACUUM

FOR

*Correct
Lubrication*



SOCONY-VACUUM OIL CO., INC. • Standard Oil of N.Y. Div. • White Star Div. • Lubrite Div. • Chicago Div. White Eagle Div. • Wadhams Div. • Southeastern Div. (Baltimore) • Magnolia Petroleum Co. • General Petroleum Corp. of Calif.

"Here's how you can spot the 'criminals' that steal wire rope life ...



Look for them regularly... to save your time and money... and America's steel

"If YOU WANT to get every hour of safe service that's built into your ropes, tell your maintenance men to get up on the cranes and shovels regularly . . . up where the wire rope operates. Tell them how to inspect it . . . how to look for the clues to what is damaging your wire rope and how to establish *your own standards* for deciding when it's necessary and economical to replace your wire ropes.

As a first step, tell them a rope should be judged by the condition of the most severely damaged lay . . . one rope lay being that length of rope in which one strand makes one complete revolution around the rope...



And to select the worst lay, make a counting of the broken wires. Watch to see if the breaks are concentrated in one or two strands. If this is the case, the rope will be considerably weaker than if they are evenly distributed.

You'll probably find some breaks caused by *Abrasion*. In extreme cases they look like this . . .



and even when not worn through, any removal of metal due to wear weakens the rope in direct proportion. Abrasion breaks occur most frequently where rope goes over sheaves and drums.

There may be breaks caused by *Fatigue* which look like this . . .



and occur where the rope has been bent around too small a radius too often or has been subject to vibration or whipping. Fatigue breaks also occur after the wire has been damaged by *Corrosion* which shows up as pitting on the surface of the wire. Improper lubrication is to blame and contributes to tension and abrasion as well.

There may be breaks caused by *Mechanical Abuse*. This cut or gouged wire is one example . . .



Careless handling during installation or an accident on the job may cause cut wires like this or mashed wires with flattened or spread ends. Mechanical abuse sometimes may so weaken the wire that it will fail in tension.

Finally, if there are breaks caused by *Tension* they will look like this . . .



And will show one side of the broken wire cupped and the other coned. Tension breaks are always caused by an overload on the wires, which may or may not have been weakened by abrasive wear, by corrosion, or by mechanical abuse. When tension breaks are found, it is usually obvious that the rope is unfit for further duty and in any event should be discarded.

As a last step, have a record kept of the condition and the service life of each wire rope, cut out the worst section when the rope is taken off and send it on to the manufacturer for an ultimate strength test. This will complete your inspection record and form a basis for future inspection and condemnation decisions.

Then, you'll be on the way to getting the maximum useful rope life built into every inch of Roebling "Blue Center" Steel Wire Rope—without taking chances on untimely and dangerous breakdown of equipment vital to wartime production schedules."



JOHN A. ROEBLING'S SONS COMPANY
TRENTON, NEW JERSEY
Branches and Warehouses in Principal Cities

★ **PROMPT SERVICE**
★ on essential orders
★ from warehouse
★ stocks or mill



ROEBLING

"Blue Center"

STEEL WIRE ROPE

PREFORMED OR NON-PREFORMED

**UNATTENDED
SERVICE**

for underground power conversion

Westinghouse IGNITRON RECTIFIERS can "go it alone."

The IGNITRON is compact, lightweight, easily made portable. Moved periodically to an unused siding or worked-out area near the working face, it delivers full power for expanding operations.

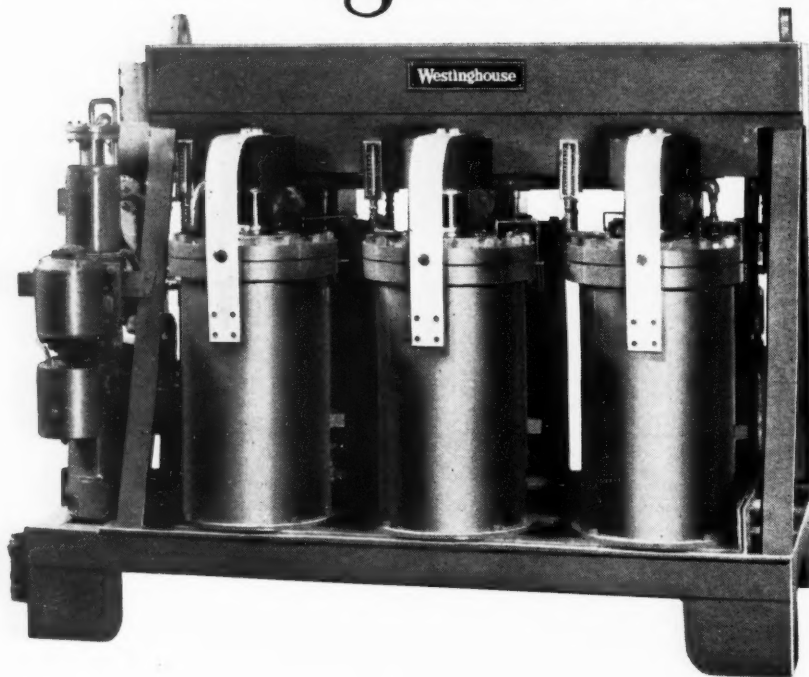
Since the Ignitron operates on the mercury-arc principle, it has no commutators or brushes that require frequent inspection and replacement. Operation is simple, and can be

made completely automatic. Maintenance and operating men are freed for more productive jobs, yet the IGNITRON is always ready to deliver instant d-c power, and to meet load demands.

You'll find the answer to the power problems of mechanized mining in Westinghouse Booklet B-3024. Write for it today. Or better still, take the matter up with your Westinghouse representative. Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa., Dept. 7-N.

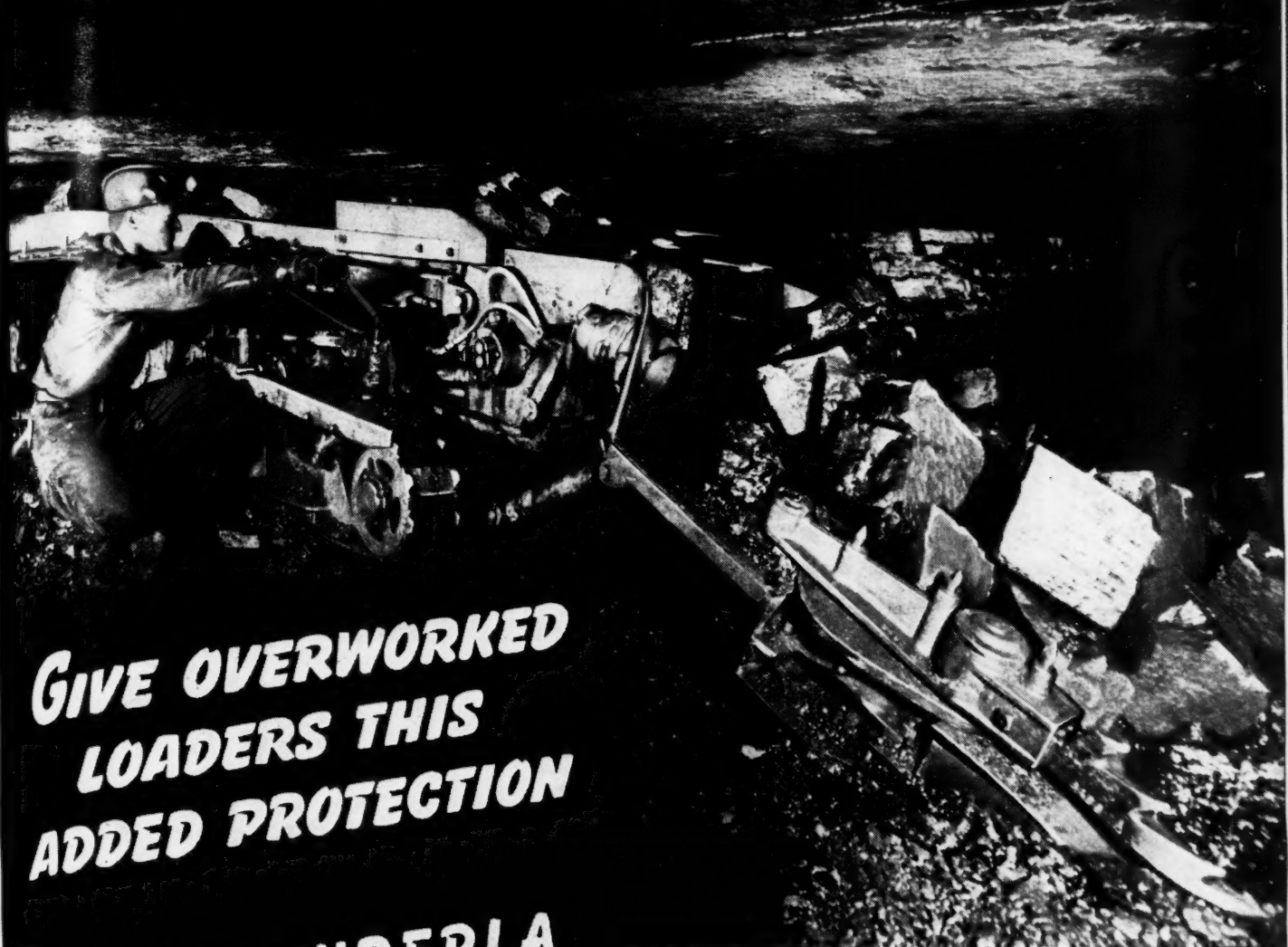
J-10221

Westinghouse Ignitron Rectifiers



HIGH, SHORT-TIME OVERLOADS CAN'T HARM IT!

High, short-time overloads, even short circuits, will not damage the Ignitron Rectifier. Ideally suited to the high load swings common to mining service; it permits higher settings for circuit breakers so that power interruptions can be reduced and more continuous production maintained.



**GIVE OVERWORKED
LOADERS THIS
ADDED PROTECTION**

**NEW SUPERLA
MINE LOADER
LUBRICANTS**

• TODAY, when every minute of production from cutters and loaders counts, these new loader lubricants give the protection needed to cut down time lost for machine lubrication and maintenance—

BECAUSE each loader—old or new—can have the exact grade of lubricant it requires from the four grades of thickened oils in the line.

BECAUSE oils used in all grades have unusually high viscosity indices—that means they do not thin out excessively at high temperatures. They give added protection even under severe operating conditions.

BECAUSE the slightly heavier consistencies of all grades reduce both wear and consumption, yet the lubricants do not separate or oxidize to cake on plates or form deposits in gear cases.

Prove these qualities in your equipment. Arrange, today, to have a Standard Lubrication Engineer help you make a test. Write Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago, Illinois, for the Engineer nearest you.

OIL IS AMMUNITION...USE IT WISELY

**A COMPLETE LINE TO HANDLE
ALMOST ANY CONDITION IN
LOADER LUBRICATION**

**SUPERLA MINE LOADER
LUBRICANTS**

Four scientifically blended thickened oils for gears, clutches, transmissions and bearings.

No. 3—A dripless oil for fairly tight gear cases.

No. 5—A fibrous structure thickened oil for gears and transmissions. Particularly useful in reducing consumption.

No. 6—A smooth type thickened oil for gear cases and gathering head pots. Can be applied with pressure gun for bearings.

No. 8—A heavy thickened oil for armature bearings and make-up in cases requiring a leakproof lubricant.

INDOILS

Three grades of straight mineral oils for hydraulic systems.

No. 95 } Provide a range of viscosities
No. 75 } to meet all loader hydraulic
No. 41 } system requirements.

Conr. 1942, Standard Oil Company

STANDARD OIL COMPANY (INDIANA)

NG...LUBRICATION ENGINEERING...LUBRICATION ENGINEERING...LUBRICATI

THE WAR CAN'T WAIT..



Donald M. Nelson says to the Mining Industry:

"Every ounce of scrap is needed immediately to get and keep war production up to a Victory level. We are counting heavily on the Nation's mines to salvage their tons of broken, useless equipment in this emergency. Old head frames and buildings should be torn down and sold. Every item, however small, should be gathered up. We urge you to organize an all-out scrap drive at once!"

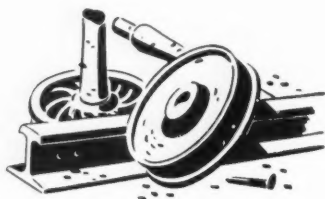
U.S. NEEDS ALL SCRAP..TODAY!

SELL YOUR SCRAP TO SHORTEN THE WAR!

HERE'S WHAT TO LOOK FOR



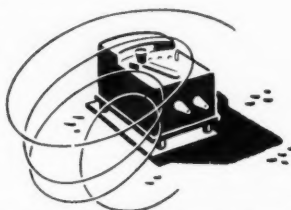
PLATES AND STRUCTURAL SHAPES . . . Clean out the repair shop—clean up the junk heap. Turn in broken and worn-out parts from chutes, bins, mine cars, locomotives, shaker screens, and tanks. Get rid of old galvanized iron buildings, and other unusable or obsolete structures.



AXLES, RAILS, WHEELS . . . One length of narrow gauge rail may provide enough steel scrap for four 500-lb. bombs. Scout up rusty, cobweb-covered bearings and coupling links. Don't assume that *anything* is useless—let salvage experts decide.



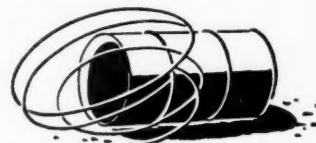
CUTTERS, LOADERS, DRILLS . . . Broken-down machinery or parts are valuable scrap. Search abandoned shafts for scrap possibilities. It means money to you and munitions to our fighting forces. Every ounce of metal you ignore helps Hitler!



WIRES, TRANSFORMERS, COILS . . . Lots of electrical apparatus is still kicking around because someone thought it might be needed "some day." Today's the day! Old commutators and motors yield tin, steel, copper, brass, lead.



BOLTS, SPIKES, RIVETS . . . Don't miss a single bet—don't pass up a single cotter pin. Old chains, odds and ends of every sort . . . if they're scrap, they're useful. Remember three rail spikes equal a deadly hand grenade!



STEEL OIL DRUMS, CABLES . . . Nothing is too small or too big to be valuable. A 50-lb. steel barrel furnishes scrap enough for a .50 calibre machine gun. And not only metal, but old Manila rope, rags, rubber are badly needed. Get behind the scrap drive today!

HERE'S WHAT TO DO . . . Appoint one man as Salvage Manager for your organization. Give him authority to *act*—to condemn old equipment, to move material, to collect scrap of all kinds. Have him separate all scrap by type. Then move it promptly through your regular scrap dealers. Don't wait—start rounding up scrap *now*—and keep it moving until the war is won!

**THROW YOUR
SCRAP INTO
THE FIGHT
!**

This message approved by Conservation Division
WAR PRODUCTION BOARD

This advertisement paid for by the American Industries Salvage Committee
(representing and with funds provided by groups of leading industrial concerns).

O-B Automatic Coupling Can Help Prevent 20% of Your Haulage Accidents

One Haulage Accident in Five Occurs in Coupling Cars

Figures of the U. S. Bureau of Mines show that in the last eight years 20 percent of the haulage accidents (actually 19.68 percent) were due to coupling cars, 14.29 percent being classed under "struck, run over or squeezed between cars or locomotives while coupling" and 5.39 percent under "squeezed between car and rib, timber or roof, while coupling." This source of accident needs study at all mines, for accidents are more numerous in mine haulage perhaps than in any other mine occupation when considered in the light of the number of men employed at that work. Where cars have to be coupled, width, plenty of light, clean roadways, straight track, coupling aids and care—al-ways care—are necessary. One accident less in five would make a big hole in the haulage accident record and save the mine foreman a lot of grief.

June, 1942 — COAL AGE

79



YOU'RE RIGHT, Coal Age, coupling is dangerous! And when one considers the many hazards encountered by motormen and snappers—short curves, uneven track, narrow rooms with only cap light for illumination—it's a wonder the percentage of haulage accidents attributable to coupling is not even higher.

But there's an answer to the problem—O-B Automatic Coupling! No longer is it necessary to go between the cars to manipulate treacherous link and pin fastenings since coupler-equipped cars join automatically upon impact. Uncoupling

is easily accomplished by a lever located on the outside corner of the car. Rigid connections keep the cars in line, cut down derailments and prevent telescoping in case of wrecks.

If you want to insure safety on your mine haulage system, it will pay you to investigate the O-B Automatic Coupler—the only truly automatic coupler that gives you positive interlock, automatic self-centering and an unbreakable rubber draft gear. Write today or consult your O-B representative for more complete information.

2301-AM

OHIO

MANSFIELD

Canadian Ohio Brass Company, Ltd. • Niagara Falls, Ont., Canada



BRASS

OHIO • U • S • A

★ BUY United States War Bonds and Stamps ★

THE MECHANIZED MINE IS THE ONLY MINE THAT KEEPS IN STEP WITH PROGRESS



Joy 32" Shuttle Car

Ease of control, and extreme flexibility in operation—together with its abundant power, have made this unit a time and money saver wherever it has been used. Its use has cut overhead and increased output in many mines.



Joy 14-BU Loader

This Joy Loader operates in seams as low as 36 inches—full automatic electric control, individual motors for gathering arms, caterpillars and pump. A rugged, heavy duty machine. Loads up to 5 tons per minute.



Joy 11-BU Loader

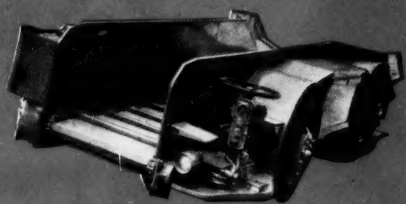
This heavy duty, mobile loader is designed for fast loading in seams averaging 60 inches or more in thickness. Embodies all the latest mechanical and electrical improvements. An economical unit.

CONSULT A JOY ENGINEER

**WRITE
PHONE
WIRE**



"Yes, Sir—If you'll take a trip through that Joy Equipped Mine of ours, I'll wager you'll mechanize everyone of your mines. Those Joy Loaders and Shuttle Cars sure do a real job—"



JOY

Joy 42" Shuttle Car

While the Shuttle Car is relatively new—its continued success and constantly expanding use, proves it does lower section handling costs and definitely increases mine output.



Joy Conveyors

Joy designs and builds conveyors to meet the specific haulage and handling needs of mines throughout the nation. Joy Engineers offer the practical experience gained from many years of successful work within the industry.

Joy Engineers offer accumulative experience that should be of great value to every mining executive considering modern mine mechanization in relation to his particular and specific conditions.

This experience and advice is available to you.

JOY

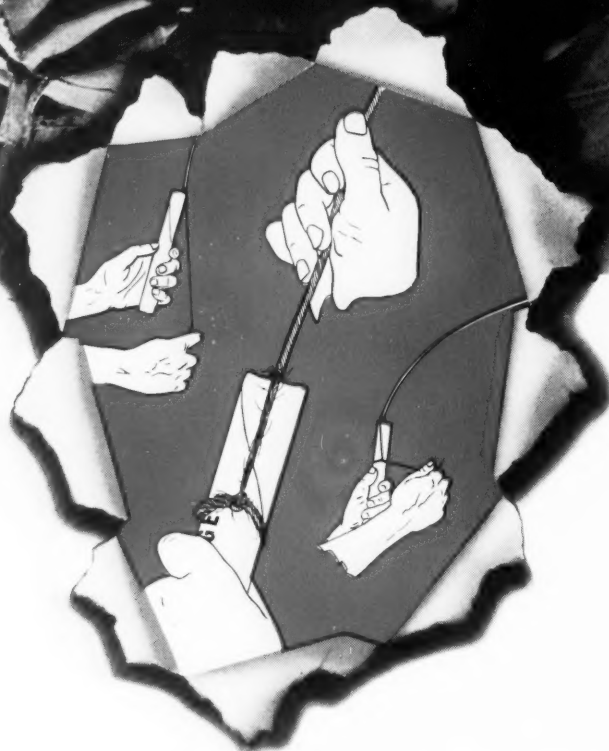
**MANUFACTURING CO.,
FRANKLIN, PA.**

**BUY
WAR BONDS**





Photograph taken in an iron mine



Tied to Win--- with Safety

When the detonating cap has been placed properly in the cartridge, the fuse and cartridge should be bound firmly together. Tarred twine is best for this purpose. Draw the twine down toward the opposite end of the cartridge so that the fuse is pulled over to one side, out of the way of the tamping stick. Tie it there . . . tight! Avoid kinks and sharp bends that might fracture the waterproof coating. Your reward for this small effort will be a lot of extra safety.

For better results in blasting, use Ensign-Bickford Safety Fuse. There's a brand designed to meet the conditions in your mine.

THE ENSIGN-BICKFORD COMPANY • SIMSBURY, CONN.
Manufacturers of Safety Fuse since 1836—also Primacord-Bickford Detonating Fuse

SF-128

ENSIGN-BICKFORD SAFETY FUSE

The Aviation Industry is doing its job...

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So begins the story of the greatest industrial expansion in history; an industrial miracle that far surpasses anything our enemies ever have done or can do. Not only did we out-produce the Axis but the acceleration in our production during the past 12 months exceeded the greatest increase in German output during their forced-draft war preparation of 1939, when their production rose from 1,100 to 1,600 planes per month.

The toughest part of our job was accomplished in 20 months. We boosted deliveries from 100 or so to 1,000 planes a week, passing the combined Axis powers. Today, Germany's curve is flattening; ours is climbing steeply. Lt. Gen. Henry H. Arnold, Chief of the Army Air Forces, assures us that Army contractors will produce not less than 148,000 planes in the remainder of 1942 and in 1943. During that same period Navy contractors will turn out at least 37,000 additional planes.

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To grasp the full magnitude of this task we must remember that a single medium bomber has 30,000 parts, which are built into 650 minor sub-assemblies to make 32 major sub-assemblies. The entire process involves 30,000 man hours of labor. Each of the two engines in this plane requires 50,000 specialized inspections. Every one of the 50 instruments entails many hours of pre-

cision workmanship. Yet today there is one factory turning out 4 bombers every day. Another produces fighters at the rate of nearly 20 a day.

To the amazement of the entire world these manufacturing miracles were accomplished without sacrificing the high standard of American aeronautical equipment. There has been some loose talk about the quality of our combat airplanes as compared with those of our allies and our enemies. Indisputable evidence of the superior stamina of our aircraft under fire is written between the lines of almost every war communique. Every battle record tells a story of heavy losses inflicted at small cost upon numerically superior enemy forces. The consistency of this performance on all the far-flung battlefronts constitutes the most eloquent testimony of the high calibre of our designs, our manufacturing methods and the skill and daring of our pilots.

And let us remember that our decisive victory in the battle of production was not won without headaches and heartaches on the part of management, labor and government.

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The Army, the Navy and the old Defense Advisory Commission set to work to draft a program. This has been revised many times — upward! Congress then proceeded, more slowly, to modify the laws that would have obstructed the realization of the objective. Then the aviation industry, without contracts, in the face of discriminatory profit-limitative legislation, and with nothing but oral assurances of governmental intentions, went ahead with its Herculean expansion plans. New factories were completed long before facilities-contracts and their funds were forthcoming.

The rugged individualists who had founded and built the aviation industry cast aside their rivalries and embarked upon a period of unselfish cooperation. Priceless engineering experience was exchanged. Material was relinquished for transfer to plants where it was needed more urgently. Successful personnel training methods and experience in the use of women workers were pooled for the benefit of all concerned. During one re-

cent month, the cooperation among eight southern California plants averted more than 1,860 potential bottlenecks in production.

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Mindful of the risk involved in educating rivals, thereby creating future potential competition, subcontractors nevertheless were sought and trained by pioneer manufacturers. Makers of toys and wheelbarrows, automatic stokers and linoleum were among those who rallied to the call. Within a year subcontracting rose from 13 to 36 per cent of the total program. It still is rising.

When the automotive industry came into the picture, aviation manufacturers gave generously of their time and knowledge to start the newcomers. Liberal licensing arrangements enabled them to reap the full benefits of technical developments. Automotive engineers swarmed through the aviation plants in search of the exacting "know-how" of the aeronautical industry.

Each type of aircraft that reaches the production stage is the result of long periods of research, design and development. The unseen workers toiling in the wind tunnels and the laboratories of government and industry are the unsung heroes who tirelessly are striving to surpass all previous efforts. Their brilliant accomplishments are eloquent testimony of the superiority of men and women who are blessed with freedom of action and thought. Today more than 20 experimental combat airplanes are under development and will replace older types as soon as they fulfill the exacting requirements of our armed forces. Among these are aircraft that promise to outfight and to out-perform any and all of the much vaunted warplanes of the Axis military machine. And this without loss of production.

Every man, woman and child of all the United Nations may fervently be thankful that those who chart our course in aircraft production have not frozen design to such a degree as to make impossible the immediate adoption of improvements as they come out of these laboratories.

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The pattern of the peace to follow also is gaining in definition. The airplane has shriveled the world to one-fifth its former size. Its use as an instrument of destruction is but a momentary distortion of the pattern of human progress. Its potential power, as a stern preserver of peace, is beyond imagination. Today's air routes of our Army Air Force Ferrying Command are the international trade routes of tomorrow. Giant airliners, by reducing time and space, will speed fraternity among the nations and disunity will give way to better understanding and goodwill.

Flying freight trains, with aerial locomotives towing glider boxcars, will serve large cities, decentralizing population and giving to inland cities many of the commercial advantages of seaports. Air mail and passenger pick-up lines will fill the gaps between these transcontinental trunk lines and tie in the smallest hamlets. Universal fly-it-yourself services will provide airplane facilities for those who do not own low cost private aircraft. Roadable rotary wing aircraft and family planes of the fixed wing type may even run household errands.

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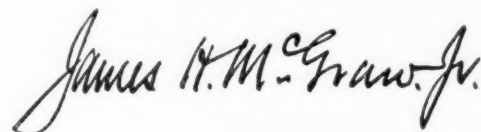
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President, McGraw-Hill Publishing Company, Inc.

CAN IT BE USED?

SALVAGE and scrap now are very much to the fore. Steel mills and other metal processors are crying for scrap to feed their furnaces. The demand for coal is growing. At the same time, equipment and materials are getting tighter. All these factors point to the need for overhauling salvage, repair and scrapping procedures to make sure that all equipment is put in usable condition and that all materials which cannot be utilized be released for employment elsewhere.

Can it be used? might well be the theme of the present-day salvage and maintenance program. This is the guiding principle in the salvage work of the Pittsburgh Coal Co., which R. W. Mackensen pithily outlines in this issue.

While salvage programs may vary in details at different properties, they might well incorporate the principles underlying the Pittsburgh Coal Co. program: constant or periodic surveys to uncover idle or scrap equipment and materials; transfer of idle material, where possible, to active sections; establishment of scrap stations, with a regular collection system; prompt consideration of equipment or material brought in to determine whether it can be reconditioned or should be scrapped; and sale of all usable equipment or material not needed in the company's own operations to others who can put it to use. A good salvage program not only helps the war effort but is good business for the coal company.

DANGER SIGNAL

THE ACCIDENT rate is going up. That fact should be a danger signal not to be overlooked even in the present hurly-burly of getting out the coal, as injuries and fatalities are directly reflected in lower efficiency and increased cost, not to mention loss of much-needed manpower for the war effort. While such things as a higher proportion of inexperienced and older men, growing pressure for production and similar factors tend to increase the accident rate, all of these are susceptible to greater emphasis on safety measures. Never before, incidentally, has such a wealth of talent and assistance been made available to the industry for assuring safety

of plant and personnel by the U. S. Bureau of Mines, the Office of Civilian Defense, the National Safety Council and other public and private agencies.

"Dollars will help win the war, but dollars spent in compensating for accidental injuries are a gift to the Axis. Compensation never built a tank or battleship," is the way A. C. Carruthers, safety authority, aptly puts it. No company can do good work with men off for repairs. The frantic effort to make up for such absences will result in more accidents and a further tonnage drop.

CREDIT COMING

BEING so close, few men in coal mining realize, perhaps, the achievements of the industry and its importance in the national economy. It might be pointed out, first, that the value of the anthracite and bituminous output in 1941, at the mine, probably was \$1,250,000,000 or more. Few industries exceed it. Anthracite and bituminous producers in 1941 probably spent over \$750,000,000 in wages and more than \$200,000,000 for equipment, materials, supplies and power.

Coal is the foundation of the vital steel industry, produces over half the country's electric power and constitutes some 80 percent or more of the fuel used by railroads, exclusive of electric power. Over 140,000,000 tons is used annually for heating and comfort purposes, according to available data. That it is progressing is shown by the stoker-coal figures published by Coal-Heat, showing an annual consumption by units under 1,200 lb. per hour of over 29,000,000 tons at the present time, compared with 10,487,000 tons five years ago.

Coal is meeting—and meeting well—not only normal requirements for its product but also those extra demands growing out of the war effort, in addition to taking up the load shed by other fuels and energies. That it can do this speaks volumes for the time and money spent over recent years in improving producing and preparation methods, promoting safety, conducting research and otherwise better preparing the industry to serve the needs of the country.

Problems still remain, of course, and progress will continue to be made, but it would seem that coal now has good reason for holding up its head in pride even

though there may have been some doubts when it was struggling through the period of liquidation and readjustment following World War I. Perhaps now is the time to abandon the defensive stand so often characterizing relations within and without the industry in recent years and do a little modest shouting about accomplishments in the face of many difficulties. Properly presented, these accomplishments cannot fail to win the favor of the public, while a proper appreciation within the industry would be a morale builder without peer among both management and employees.

SMALL COAL CLINKERS

GRINDING up raw coal and testing it for fusion temperature gives an inadequate idea of what takes place in the furnace and what has to be done to get the best possible combustion conditions and maximum efficiency. A 1x½-in. coal when burned gave 20 percent of clinker; the rest was dust or isolated particles of ash. But when the same fuel was crushed to ⅜x⅛-in., 75 percent of clinker was formed. Fuels with a high-ash content give a lower percentage of clinker than fuels with low ash if both fuels are of the same size.

These statements of A. C. Dunningham and E. S. Grummell, before the Institute of Fuel of Great Britain, testify to the importance of size and especially of ash content. Most of the clinker was found in the bottom layer where the atmosphere still contained free oxygen. All the ash in the coal tested, regardless of size, had about the same fusing temperature, suggesting that it was size of ash, not kind of ash, that determined the action.

BACKWARD STEP

ALTHOUGH conceived and established for a worthy purpose, the operations of the National Labor Relations Board have been the frequent cause of both amazement and pain. While the board of course cites the fact that such decisions are based on law and precedent, some of them nevertheless carry the seeds of adverse consequences far outweighing any possible benefits. The board's stand on unionization of supervisory employees at operations of the Union Collieries Co., in western Pennsylvania, is a case in point.

In its decision handed down in June ordering an election to be held to determine if the supervisors should be represented by the Mine Officials' Union of America (independent), the board necessarily had to class these men as "employees" rather than members or representatives of the "employers' group." That there is room for argument on this score is evidenced by remarks in the dissenting opinion of Board Member Gerard D. Reilly, who also pointed out that if such unionization was approved it would be conceivable

that the United Mine Workers would extend its jurisdiction to take in supervisory employees. This would leave the operators in the awkward position of having the men on whom they rely to deal with employees as members of the same union group.

Even if the supervisors were members of a separate union, the situation still would be bad, as operator representatives pointed out in arguments before the board after the Mine Officials' Union carried the election. Even further danger was envisioned in strong protests by representatives of the Commonwealth of Pennsylvania, who contended that the attempted unionization would seriously hamper enforcement of safety laws, in addition to infringing on "the sovereign power of the State." Little good can be said for the move from any standpoint, even that of the supervisors involved, although it might be noted in passing that examination of the relations between company and bosses might benefit both.

EVERYTHING DONE?

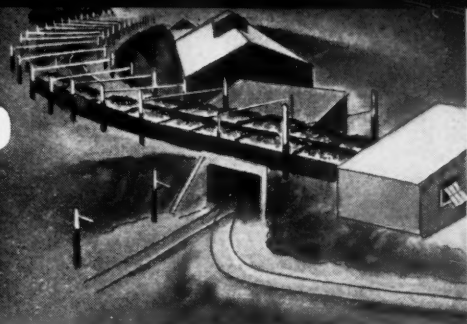
COAL-MINING men might make it a practice to sit down every so often and think over the methods used. Such soul-searching should result in a number of worth-while changes in the interest of efficiency, low cost and safety. For instance, as Robert Carson suggests in this issue, two scrapers in tandem might be used to increase the output from a wall and the efficiency of the crew.

The number of questions a man might ask himself are many and their character various, but the basic premise should be neglect of no phase of operation in this periodic study. A slight change in tracklaying methods might result in 25 or 30 tons or more from a loading machine each shift. A slightly different method of inspection or lubricating might avert many time-consuming breakdowns. Installations of a few inexpensive guards might save a few fingers or toes, not to mention more serious injuries. Few are the properties where at least some opportunities for improvement do not exist, and searching is one of the best ways of finding them.

GOOD CAUSE

THE WEEK of Oct. 4-10 has been proclaimed "Fire-Prevention Week" by the President of the United States. "Any loss of life, any interference with production, any loss of critical materials, hinders and impedes our war effort," the President trenchantly states. Well worth study and action are his recommendations that measures be taken throughout that week and throughout the year "to conserve our human and material resources from the destructive toll of fire." Cooperation with the Office of Civilian Defense in this good cause will pay dividends all the way around.

COAL AGE NEWS ROUNDUP



Sydney A. Hale, Coal Age Editor, Dies After Long Illness

SYDNEY ARTHUR HALE, 54, editor of *Coal Age*, died Aug. 12 in his home at Tarrytown, N. Y., of a brain tumor, from which he had been suffering about eight months.

Mr. Hale was born of naturalized parents in Chicago, Aug. 1, 1888, the son of Ephraim Hale, a native of Bothwell, Ont., and Eleanor M. Hale, born in Florence, Ont. He was educated at the Sheridan Grammar School and Wendell Phillips High School, Chicago.

In 1906, he was employed in the business department of the *Chicago Daily News*, which he left in 1908 to become associate editor in charge of publication of the *Daily Traffic World*, Chicago. During 1913, he engaged in the printing business in that city, forming the Hale-Crossley Printing Co., leaving that work in 1914 to become western representative for the editorial and business departments of the *Coal Trade Journal*, Chicago, of which publication he became editor in 1918, continuing until 1924.

During that time, he was market investigator for the U. S. Coal Commission and was co-author, with the late F. G. Trvon, of the U. S. Geological Survey, of the Coal Reports for 1919-22. In 1925, he was made associate editor, and later managing editor, of *Coal Age*, becoming editor-in-chief in 1928 and continuing in that position until his death.

Mr. Hale was a recognized authority on labor, production, distribution and transportation statistics and progress in coal mining and his trenchant pen emphasized and threw light on many of the directives which influenced the progress of the coal industry, particu-

larly in regard to mechanical mining and research. It was his keenness of perception, his ability to choose and marshal words to express his meaning, his ability to know what to say and what to leave unsaid and his kindly judgment of his fellowmen that made him an editorial writer of clarity and distinction and caused him to receive in 1927 at the hands of the Associated Business Papers, Inc., the award of merit for the best editorial in the business press of 1926, though he was not at that time editor of his paper.

He had a whimsical humor, quiet but incisive, executive ability and good judgment, and a devotion to accuracy. Wide reading, the ability to observe and to learn had given him more than a university education could have supplied.

Every inch an editor, once he set himself to a task, however large and

onerous, no reading was too dull and no effort too great to attain his purpose. He liked to work far into the night, a disposition that, with his greater activity of mind than body, may not have been without unfortunate result. It was a cruel fate that, in the last few months, dulled those mental faculties and laid on him a coma that gave only short moments in which he could recognize his friends and associates and greet them with that good-natured raillery that had won their loyalty and goodwill.

His wife, Laura M. Hale, to whom he was much devoted, died Aug. 29, 1941, a union without children lasting 22 years. Her decease is believed to have hastened his decline and death. After funeral services at Tarrytown, N. Y., he was buried with his wife near their country home in Wallingford, Vt. He was a member of the Lotos Club in New York, the Union League Club in Chicago, and the American Institute of Mining and Metallurgical Engineers.



The late Sydney A. Hale at his desk.

Steps Taken to Halt Coal's Manpower Losses; Miners Ask Cost-of-Living Wage Increases

Bituminous Manpower Loss 43,000 in Six Months—Strategic-Metal Miners Asked to Stay on the Job—Coal Committee Organized to Handle Manpower Problem—More "Victory Production Committees" Get Under Way—Anthracite and Bituminous Wage Increases Requested

ANNOUNCEMENT that 43,000 bituminous miners had been lost in the first half of 1942, creation of an operator committee to consult with government officials and agencies on preserving coal-mine working forces and growing pressure for steady work were highlights of the manpower situation in August. August also brought an increase in the number of wildcat strikes and proposals from the miners that pay rates be increased.

Much the same conditions also were reported from Canada. In Alberta and British Columbia, for example, increased business and industrial activity, coupled with a declining supply of other fuels and the departure of miners for the armed forces and war industries, has resulted in a critical producing situation. Another factor is the lack of experience of replacements, plus wildcat strikes. Part of the latter are reported to be the outgrowth of attempts by the men to get an increase in the wage rates set forth in the union agreements. Nova Scotia also was plagued by unauthorized strikes. "Lack of cooperation" by

employees, in fact, led to proposals for closing two of three collieries at Inverness by Nova Scotia authorities.

"The bituminous coal industry is faced with a most serious problem with respect to the loss of manpower in and around the mines, which by no means is truly reflected in figures that indicate only the loss of men," said John D. Battle, executive secretary, National Coal Association, Aug. 21, in commenting on a press statement by General Hershey, Selective Service Director, in which the director asserted that the coal miners' part in the war-production program was second to none. "From recent reports secured from the members of the National Coal Association, typically representative of the industry throughout the nation," said Mr. Battle, "it is indicated that there was a net loss between Jan. 1 and July 1 of some 43,000 men. These losses occurred in such positions as machine runners and helpers, motormen, mechanics, cutting-machine operators, coal loaders, tracklayers, mining engineers, shovel operators, etc.



"In a study of this data at hand, some companies have lost from 10 to 15 percent of their men, while others indicate a net loss of small percentage; say 3 percent. At the same time, they show a loss of 10 to 12 percent in tonnage produced. This is the result of inexperienced men, older men and those not fully competent. The accident rate is increasing. This is a particularly disturbing factor at this time. It has come about through no failure on the part of the industry."

August also brought forth a proposal by the Army that an alleged surplus of workers in the coal fields be transferred to copper and other mines producing strategic war metals, this to be accompanied by a shift of workers from gold and other precious metal operations to fill the gap at the strategic mineral plants. So far, apparently, this proposal has not gotten beyond the suggestion stage, and indications were that it would be opposed by government officials directly engaged in promoting coal production.

Strategic metals also were favored with an urgent appeal by War Manpower Commissioner McNutt Aug. 21 asking employees to stay on their jobs. Outlining a five-point program, Commissioner McNutt stated that it was designed to make miners' wages more nearly comparable with those in other war industries, including early action and retroactive awards by the War Labor Board in cases now up for decision; assure deferment of mine workers through instruction by Selective Service to local boards; increase the labor force by urging operators to utilize the training facilities of the War Manpower Commission and the recruiting facilities of the U. S.

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Weirton Employee Boosts War Program

J. M. Novotny, an employee of the Isabella (Pa.) mine of the Weirton Coal Co., with two samples of a comprehensive list of posters prepared for the use of that organization in stimulating war production, safety, purchase of War Bonds and Stamps, conservation and salvage of materials and other measures leading to victory.

Mine Priority Aid Increased: Materials Control Tightened

With the new Production Requirements Plan giving the War Production Board a much clearer idea of materials requirements under the war-production program, the trend toward allocation in accordance with needs rather than by simple priorities was strengthened in August. Meanwhile, mining companies were given further assistance commensurate with their vital role as suppliers of raw materials and fuel, and Priorities Regulation No. 10 (July Coal Age, p. 39) was revised, including the replacement of the original classifications symbols designed to show the end use of materials with a new series of numbers. The revised regulation was proposed to go into effect Aug. 31.

Repair Ratings Raised

Amid rumors that coal would be given even higher ratings to insure getting needed equipment and materials, provisions for ratings as high as necessary to get materials for certain mining equipment in case of breakdowns were granted by the War Production Board. In addition, Amendment No. 3 to Preference Order P-56, effective Aug. 8, provided for applying an A-1-a rating to a certain proportion (30 percent mentioned) of mine-repair and maintenance requirements without having to clear each case through the Mining Branch. The remainder was given an A-1-c rating, with ratings of A-8 and A-10 for other than critical maintenance and operating supplies. And with the growing feeling that A-1-a is now inadequate, the question of granting even higher ratings to manufacturers of mining equipment under PRP for a substantial part of their quarterly requirements was reported under consideration.

Deliveries of iron and steel plate were last month restricted to ratings of A-1-k or higher, with certain exceptions. The growing scarcity of rails of weights used in mining resulted in a request by the Mining Branch for special information on applications for priority assistance, including data on stocks, average consumption per month or quarter, orders not yet delivered, length of time without rail of the weights desired on which operation depends and tonnage losses, actual or potential, resulting from failure to receive rail.

Rigid controls on the distribution and use of all types and grades of softwood lumber were announced effective

Aug. 27 (Conservation Order M-208). Use of copper or copper alloy in fuses, other than the current-carrying parts, was prohibited effective Sept. 11 to save 1,200 tons of this metal annually.

A drive to locate every piece of second-hand machinery in the United States was launched by the Office of Price Administration in August as a means of getting data on which to base prices. The drive also is expected to provide a census of idle machinery for the use of the WPB, as well as obsolete machinery that might be scrapped.

Wilbur A. Nelson Appointed To Speed Mine output

Dr. Wilbur A. Nelson, Chief of the Mining Branch of the War Production Board, has been appointed special assistant to the Deputy Director General for Industry Operations, it was announced Aug. 26 by A. I. Henderson, Deputy Director. Dr. Nelson will deal with production and related problems of mines, mills and smelters, with emphasis on developing a program to obtain maximum mining production. Among other things, he will:

1. Act as a clearing agent for solution of problems relating to prices of minerals, particularly as they affect production.
2. Handle tax matters as they affect mining production with the proper government authorities, with a view to preventing impairment of mineral production because of taxation which may inhibit maximum mine production.
3. Develop a morale program to attack the broad problems of minor absenteeism. At the present time, production in many mines is suffering from absenteeism in some form.



Washington Press Photos
Wilbur A. Nelson

4. Handle development of access roads to all mines.

5. Undertake any over-all problems of mine operations which are holding back production.

"Current pressure for minerals production," said Dr. Nelson, "is bringing serious problems to mine operators. One result of this operating under forced draft is the mines' inability to carry forward the necessary development work. We are doing something about this so that future production may not break down when deposits already developed are mined."

Dr. Nelson has taken leave of absence from the Mining Branch. Dr. Marcellus H. Stow, formerly Assistant Chief of the branch, will become Acting Chief during Dr. Nelson's absence.

Price Increases Recommended For Bituminous Coal

Increases of 5 to 30c. per ton in minimum bituminous coal prices to various market areas and 0 to 60c. in railroad fuel levels were recommended by Examiner Floyd McGowan, Bituminous Coal Division, in a report released July 30. This action was taken in General Docket 21, the first phase of which was completed by an order of the Secretary of the Interior April 13 affirming certain determinations of the Acting Director on questions of law and policy subsequent to the Director's cost determination made public Jan. 31, 1942. Oral argument on the examiner's findings started Aug. 20 before Acting Director Wheeler.

Increases for coal other than that used for railroad fuel recommended by the examiner are as follows:

Related Groups of Market Areas	Recommended Increase, Cents per Ton
1-21	20
22-31, 103	10
32-41, 47-50, 52-78	5
42-46	15
100, 102, 105-112, 118, 125- 129, 131, 133-137, 139-141	20
104, 114-116, 151-157	5
113, 117, 120-124, 130, 132, 138, 142-150	30
200-202	15
203, 215, 216, 234, 237 (Idaho), 240-241	5
204-212	10
213-214	15
217-232, 236, 244-246	20
237 (Washington), 238-239, 242-243, 247-254	25

All shipments, except railroad locomotive fuel, for Price Area 4 (District 14) to be increased 25c. per ton in addition to the increases listed above for the various market areas into which coals of this price area move.

Under the proposed new schedules, it was pointed out, coal shipped from

one producing district into two or more market areas would take the increase prescribed for those areas; say 20c. per ton to one area and 10c. per ton to another. Increases in locomotive fuel prices and other railroad fuel taking locomotive fuel prices were recommended as follows:

Price Area	Recommended Increase, Cents per Ton
No. 1.....	20
No. 2.....	0
No. 3.....	30
No. 4.....	60
No. 5.....	5
No. 6.....	15
No. 7.....	5
No. 9.....	15
No. 10.....	30

Exceptions to the findings of the examiner were taken by Luther Harr, Bituminous Coal Consumers' Counsel, who contended that the proposed schedules would freeze a distribution pattern now five years old by permitting wide variations in f.o.b. mine prices so that delivered relationships would not be altered. Mr. Harr proposed as an alternative the "automatic adjustment" method under which minimum prices in each price area would be adjusted to equal the last determined cost for that price area.

No Effect on Ceilings

If adopted, the new minimum prices, according to the Office of Price Administration, would have little effect on ceilings which have been established. OPA in August busily bent its efforts toward adjustments to prevent hardships to specific producers and to insure prices which would preserve deliveries to various consumer classes. Among the actions were: a temporary schedule of maximum charges on barge shipments to New York and New England, coupled with steps to absorb any increases in cost compared with shipments by other methods; adjustment of minimum prices on mine-run and slack shipments from western Pennsylvania, West Virginia and Ohio to the Great Lakes; establishment of maximum prices for bituminous coal for direct use in vessels as bunker fuel; exemption of resales of coal to Canadian distributors from price control; increases in prices chargeable by certain high-cost producers of beehive coke in Pennsylvania, accompanied by establishment of maximum rates for trucking coal to the ovens, etc. In addition, the Acting Director of the Bituminous Coal Division authorized special prices to promote the movement of industrial coal from New Mexico and Arizona to Nevada and California.

Fuel-Oil Situation Continues Critical; Coal and Oil Movement Boosted

Conversion Progress Unsatisfactory in the East—Rationing Plan Considered—Further Steps Taken to Provide Conversion Units—Oil Flow to the East Boosted—Pressure on Coal Movement Increased

GETTING even tighter in August, the fuel-supply situation in the East was marked by increased pressure to promote conversion, accompanied by greater activity in increasing the movement of both coal and oil into the region. The prospect of fuel-oil rationing also came closer last month, during which certain other areas of the country also were singled out as critical from the standpoint of coal reserves available for the winter.

Canada also was going through much the same difficulties as the United States. Late in July it was announced that the city of Montreal would be compelled to replace all its oil-heating installations with coal-burning equipment. The Coal Administration of the Wartime Prices and Trade Board arranged for a "Solid Fuel Credit Plan" to enable consumers to borrow from the banks to finance immediate purchases. Originally intended to expire Aug. 31, the plan later was extended to Sept. 30. Canadians using coal also were urged to accept suitable substitute sizes in case those ordinarily used were not immediately available.

Developments in the United States got under way in August with the taking effect Aug. 3 of an order suspending deliveries of fuel oil until Sept. 16 for the operation of heating and cooling equipment in 17 east coast states and the District of Columbia. This step was taken by the War Production Board to permit building up oil stocks. On the same day, President Roosevelt warned the East's householders with oil furnaces that fuel oil for even "minimum requirements" might not be available this winter and called for public cooperation in the government-industry fuel conservation and conversion plan.

Conversion progress in the East in August still continued unsatisfactory in the household field, although better progress was made in industry. In the latter category, some 784 firms were reported to have changed voluntarily from oil to coal as of July 23, making the oil saving slightly over 21,000,000 bbl. annually. Despite this advance, Petroleum Coordinator for War Ickes announced early in the month that less than 1 percent of the 1,400,000 oil-fired installations in the northern half

of the Atlantic seaboard had been converted since Jan. 1, 1942. Less than 4 percent of the owners had taken any steps to convert.

About 50 percent of the present oil-burning furnaces, said Mr. Ickes, originally were coal burners. Only 13 percent of a group of owners interviewed had given any consideration to changing over and of this group 64 percent "had only thought it over." The original goal set up by government agencies was a minimum of 400,000 conversions (25 percent) in advance of the coming winter season. With the situation becoming increasingly grave, it was pointed out that probably only 75 percent of the normal "unrestricted" fuel-oil requirements would be available to New England and other east coast areas this winter, with 85 percent as the figure for the Middle West.

Oil Conversion Pressed

Measures taken to stimulate conversion included appeals to 17 eastern State governors for aid in the drive, enlistment of the cooperation of local authorities, easing of credit rules on purchases of equipment for making changeovers and for improving the insulation of homes, and the issuance of conversion recommendations by both government agencies and the anthracite industry, with coal-mining companies backing up the program by extensive advertising. Curbs on the use of hot water were forecast, and plans were laid for rationing oil.

Under the rationing proposal, states on the Atlantic seaboard would be divided into four areas, with the quantities which consumers could obtain regulated on the degree-day basis. Appointment of a committee made up of Undersecretary of War Patterson, Secretary Ickes and Price Administrator Leon Henderson to decide on rationing was announced by Donald Nelson, chairman of the War Production Board, Aug. 21. This committee, it was stated, is "to determine, first, whether or not the use of fuel oil should be curtailed in the east-coast area during the 1942-43 heating season and, second, what method of rationing should be used if a decision to curtail is made."

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MODERN METHODS

Mark Esco 10 Mining and Preparation

Mobile Loaders Served by Shuttle Cars—One Jig and Air Table
Clean 5x1¼- and 1¼x0-In. Coal—Vibrating Screens Through-
out—500-Ton Bin Feeds Preliminary Picking Belt and Conveyor

By J. H. EDWARDS

Associate Editor, Coal Age

MOBILE LOADING, shuttle-car service haulage without a car trimmer at the elevator and a combination wet-and-dry preparation plant devoid of shaker screens are features of the new Esco No. 10 mine of the Utilities Elkhorn Coal Co., in eastern Kentucky. With a production in excess of 22,000 tons in May, operating officials of the company smiled with satisfaction after months of adversity which began soon after the first car of coal was shipped, Dec. 7, 1941. Only 150 ft. from the drift portal the main entry encountered an uncharted fault which persisted for 600 ft. With this successfully penetrated, development now going on in normal seam conditions and additional underground equipment ready for installation, the operation now is prepared to produce in earnest.

The mine is in the Elkhorn No. 3 seam, yielding a byproduct coal and lying nearly level some 700 ft. above the railroad. Beyond the fault area development to date discloses an average thickness of 63 in. of coal and a normal range of 56 to 66 in. Thirty inches above the floor is a soft shale parting 2 to 4 in. thick. Six inches from the top is another continuous parting, but only of knife-blade thickness. The bottom is hard and, excepting local spots, the roof is strong. The major job of the cleaning plant, therefore, is to remove the parting materials.

A glance at the low percentages of ash and sulphur and the high fusion softening temperatures given in Table I tells why the sales agent, United Collieries, Inc., Carew Tower, Cincinnati, is calling for increased production from the mine. These data,

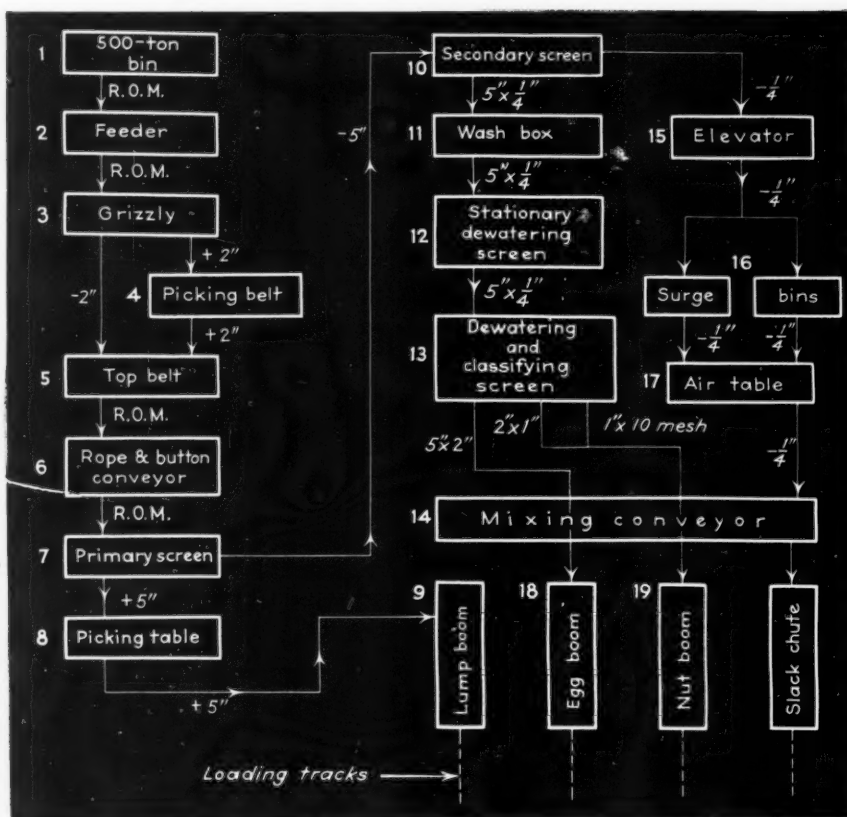
according to J. E. Bowman, vice-president and general manager of the operating company, are from analyses furnished to the Code Authority. Practically all of the output goes to the byproduct market.

Esco No. 10 mine is in Pike County, Kentucky, on the Big Sandy & Elkhorn subdivision of the Ches-

apeake & Ohio Ry. 6 miles from Shelby Junction and 23 miles from Jenkins. By highway it is 15 miles from Pikeville, of which 12 miles is paved and the remainder rock-surfaced. This is not the first mining at Esco. With a Morrow tippie on the site of the present new plant the Elkhorn & Shelby Creek Coal Co. had worked out an



Esco No. 10 four-track tippie and preparation plant, with 906-ft.-long rope-and-button conveyor to dump hopper on mountainside.



Flowsheet, new Esco No. 10 preparation plant.

acreage adjoining the 1,000-acre tract now immediately available to the new mine.

The Utilities Elkhorn Coal Co. was organized in 1928 and now operates two other mines in addition to Esco No. 10: Boldman No. 5, also in Pike County, and Martin No. 8, in Floyd County (Coal Age, May, 1942, p. 48). Peak production of the company was 511,000 tons in 1933 from three mines. Virgie No. 6 mine, 2½ miles from the new operation, was worked out in 1938, leaving but two mines, which in 1941 produced 295,000 tons. The lease on the Esco No. 10 property was taken in 1937 with the idea of replacing Virgie No. 6.

Capacity of the new preparation plant is 250 tons per hour and an outstanding feature is the ample reserve capacity of the washing unit, rated at 206 tons per hour of the 5x4-in. fraction of the mine output. Carbon (¼-in.) is cleaned on an air table. Construction of the top-of-hill dump bin, conveyor galleries and plant proper is wood throughout except that the surge bins ahead of the air tables are steel. Composition roofing is used but the siding is Armco No. 26-gage corrugated galvanized steel. With machinery purchased from several manufacturers, principally Robins,

Link-Belt and Allis-Chalmers, the coal company handled the construction and installation with its own force.

Mine cars of the drop-door type are dumped into a combination hopper and storage bin with a capacity of 500 tons. This bin is 1,200 ft. from the haulage drift. From the bottom a 30-in.-wide, 300-ft.-long Robins belt conveyor carries the coal on a 3-percent down grade to a rope-and-button retarding conveyor. An efficient feature of this hilltop equipment is a Robins picking belt between the car-dump bin and the long belt. Two men pick at this point and there is no trouble nor expense involved in getting rid of that part of the refuse. It slides by chute to a large-capacity dumping space in a side hollow.

This 42-in. x 20-ft. picking belt is directly above the loading end of the 30-in. belt. Only the size which slides over a grizzly, or bar, screen with 2-in.-wide slots is picked on it. The through material lands directly on the 30-in. belt and serves as the cushion for the larger material as it flows onto the belt from the picking belt above.

Capacity of the rope-and-button conveyor is 350 tons per hour. It is fitted with a new rope (American Steel & Wire) and new buttons (American Car & Foundry) but uses

the reconditioned Fairmont sheaves of the conveyor which served the earlier mine. Gallery and troughs are new. The drive includes an unusual double motor arrangement (for details see page 70 of this issue) installed by O. J. Williams, electrical and mechanical engineer for the coal company.

The major equipment items in the preparation plant are detailed in Table II and their place in the preparation system is shown in the accompanying flowsheet. Plus 5-in. lump, after a second hand picking in the bottom tippie, goes directly to the loading boom. From a secondary screen the 5x4-in. goes to an air-pulsated jig washer and the minus ¼-in. to an air table. A mixing conveyor extending through the center of the plant and over the back ends of the booms moves in its two-compartment bottom strand any size to any one of the three booms or to the chute. The single-compartment top strand will be used to carry lump and/or washed coal to a lump crusher for which provision has been made by installing an elevator and crushed-coal vibrating screen not shown in the flowsheet. The plant also includes space for a second air table of the same type. The mixing conveyor is pictured on page 72 of this issue, on which also appears a description of how the center partition strip was arc-welded to the bottom plate without warping.

Vibrating Screens Employed

All four of the mechanical screens in the tippie are of vibrating type manufactured by Allis-Chalmers. Primary, secondary and crushed-coal screens are "Ripl-Flo" units and the dewatering and classifying screen is a "Low-Head" machine. All these screens are driven by Allis-Chalmers Type ART 440-volt motors in sizes from 5 to 20 hp. with Tex-rope V-belt connections.

The two-section five-compartment Link-Belt air-pulsated Model 5044 washing jig is equipped with seven General Electric motors most of which are new Tri-Clad units. Additional fractional horsepower motors drive Thrusters which operate two of the three refuse gates. Each elevator is driven by a 5-hp. motorized Link-Belt gear reducer, the piston valve shaft by a 1½-hp. motorized reducer with Link-Belt P.I.V. variable drive, the three gates by 1-hp. motorized reducers, and the Roots-Connersville blower by a 50-hp. 1,200-r.p.m. motor.

Pressure blowers, two in number and made by Clarage, supplying the

TABLE I—COAL CHARACTERISTICS (FROM ANALYSES FURNISHED TO CODE AUTHORITIES)

	Fusion (Softening) as Ash Degrees F.	B.t.u. (as received)	Percentages		
			As Received in Laboratory	Dry Basis	Sulphur (as received)
5-in. lump.....	2,960	14,497			0.86
Moisture.....			3.02	.....
Ash.....			1.18	1.22	
Volatile.....			37.06	38.21	
Fixed carbon.....			58.74	60.57	
5x2-in. egg.....	2,928	14,322			0.84
Moisture.....			2.88	.....
Ash.....			2.87	2.96	
Volatile.....			37.30	38.40	
Fixed carbon.....			56.95	58.64	
Straight r.o.m.....	2,820	13,943			0.84
Moisture.....			3.73	.....
Ash.....			4.25	4.41	
Volatile.....			35.90	37.29	
Fixed carbon.....			56.12	58.30	
1x1/4-in. stoker.....	2,916	14,063			0.84
Moisture.....			3.35	.....
Ash.....			3.86	3.99	
Volatile.....			36.56	37.83	
Fixed carbon.....			56.23	58.18	
2-in. nut-and-slack.....	2,708	13,914			0.71
Moisture.....			3.03	.....
Ash.....			3.94	4.06	
Volatile.....			37.15	38.31	
Fixed carbon.....			55.88	57.63	
1/4x0-in. carbon.....		12,450			0.85
Moisture.....			6.82	.....
Ash.....			9.77	10.49	
Volatile.....			31.18	33.46	
Fixed carbon.....			52.23	56.05	

TABLE II PRINCIPAL COAL-HANDLING EQUIPMENT AT ESCO NO. 10 PLANT

Number on Flowsheet	Description
1.....	Hopper and bin, capacity 500 tons, receiving coal from drop-bottom mine cars.
2.....	Shaking feeder, Robins standard type, 33 in. x 8 ft.
3.....	Grizzly, or bar, screen with 2-in.-slot openings.
4.....	Picking table, belt type, Robins, 42 in. x 20 ft. c.-c. with Mohawk 5-ply 28-oz. belt, 1/4-in. top cover, 1/2-in. bottom cover.
5.....	Top belt conveyor, 30 in. x 300 ft. c.-c., Robins, with Mohawk 5-ply 28-oz. belt, 1/4-in. top cover, 1/2-in. bottom cover.
6.....	Rope-and-button conveyor, 350 tons per hour, 906 ft. c.-c., new American Steel & Wire rope, 1-in., 6 x 30, Type G, reversed lay, flattened strand, mild plow-steel grade with wire-rope center.
7.....	Primary screen, Allis-Chalmers "Ripl-Flow" vibrating unit, 4 x 10 ft. with 5-in.-round perforated plate deck.
8.....	Picking table, Morrow apron-conveyor type (from old Esco tippel).
9.....	Lump boom, Jeffrey apron-conveyor type (reconditioned), 36 in. x 36 ft.
10.....	Secondary screen, Allis-Chalmers "Ripl-Flow" vibrating unit, 5 x 14 ft., double deck, 2-in. square-hole top deck, 1/4-in. square-hole bottom deck.
11.....	Link-Belt air-pulsated jig, two-section five-compartment, Model 5044; rated capacity, 206 tons per hour 5 x 1/4-in. coal.
12.....	Stationary drainage screen, 30 x 60 in., from which a large percentage of wash water drains to sludge tank.
13.....	Dewatering and classifying screen, Allis-Chalmers "Low-Head" vibrating unit, 5 x 14 ft., triple deck, 2 3/4-in. round-hole top deck, 3/4-in. round-hole second deck and 10-mesh stainless steel cloth on bottom deck.
14.....	Mixing conveyor, 36-in.-wide by 16 in.-high flights, 91-ft. centers length with centers distance 41 ft. on rise of 13 deg. and 50 ft. level, single-compartment top strand, two-compartment bottom strand, Link-Belt chain, flights and pans built at mine.
15.....	Elevator, Link-Belt bucket-chain type, 16 x 9-in. buckets, 62 ft. c.-c.
16.....	Two surge bins, inverted-pyramid shape 10 x 10 ft. x 14 ft. deep.
17.....	Link-Belt-American "Twin-Dex" pneumatic separator, 5 x 18 ft., to handle in this plant 35 tons per hour of 1/4 x 0-in.
18 and 19.....	Egg and nut booms, 42 in. x 36 ft., Morrow apron-conveyor type (reconditioned from old Esco tippel).
20.....	Bucket-chain elevator*, Link-Belt, 18 x 12-in. buckets, 32 ft. c.-c.
21.....	Crushed-coal dedusting screen*, Allis-Chalmers "Ripl-Flo," 5 x 12 ft., 1-in. square-hole wire-cloth top deck, 3/8-in. square-hole wire-cloth bottom deck, rated to handle in this plant 40 tons per hour of 5 x 1-in., 35 tons per hour of 1 x 3/8-in., 60 tons per hour of 3/4 x 0-in.; total, 135 tons per hour.

*These two items installed but not in use pending purchase and installation of a crusher for plus-5-in. lump.

Link-Belt-American "Twin-Dex" table, are each driven by 7 1/2-hp. American motors with Browning V-belts. The 3,000-g.p.m. 65-ft. head Gould single-stage circulating pump for the washer is driven by a 60-hp. General Electric motor. Total connected load for the tippel and preparation plant is 160

hp., all consisting of 440-volt motors.

The load includes a 15-hp. General Electric motor driving a Gould 150-g.p.m. creek pump which forces make-up water to a 60,000-gal. storage tank on the hillside above the plant. In the plant itself there is a 12,000 gal. sludge tank and a 30,000-gal. settling tank.

Make-up water is introduced via the sprays on the dewatering screen and into the settling tank when it is washed out to dispose of the sludge. Magnetic starters used in the plant consist principally of three makes: General Electric, Allis-Chalmers and Cutler-Hammer.

Six men comprise a tippel crew. One is the foreman, one the washer operator, two are car droppers and the other two do picking and general work.

Underground mining machinery (250-volt) now in use or on the ground when this article was prepared is as follows: four shortwall cutting machines with 7 1/2-ft. bars using standard bits (two Jeffrey 35B's with Cincinnati chains and two Goodman 112A Universals with Goodman chains); four Joy caterpillar short-wall trucks; five "Little Giant" Type 572 permissible electric coal drills with "Coalmaster" conveyor-type augers and Y bits, Central Mines Equipment Co.; four Joy 14BU permissible loading machines; eight Joy 42E 5-ton two-wheel-drive two-wheel-steer cable-reel shuttle cars; four Joy portable rubber-tired elevators; and four 5-hp. car-spotting hoists, Flood City Type CSI, 6,000-lb. rope pull at 35 f.p.m.

Four Units on Hand

The above constitutes four complete units. During May, the first month that development production was fairly under way and when 22,757 tons was shipped, only two of the units were in use and their regular schedule was six days per week, two shifts per day. One unit was triple-shifted a few days. The total unit shifts worked in May was 111. A third unit went into service June 1 and the fourth was scheduled for service as soon as development had been carried to a point where a second substation could be installed near the future load center.

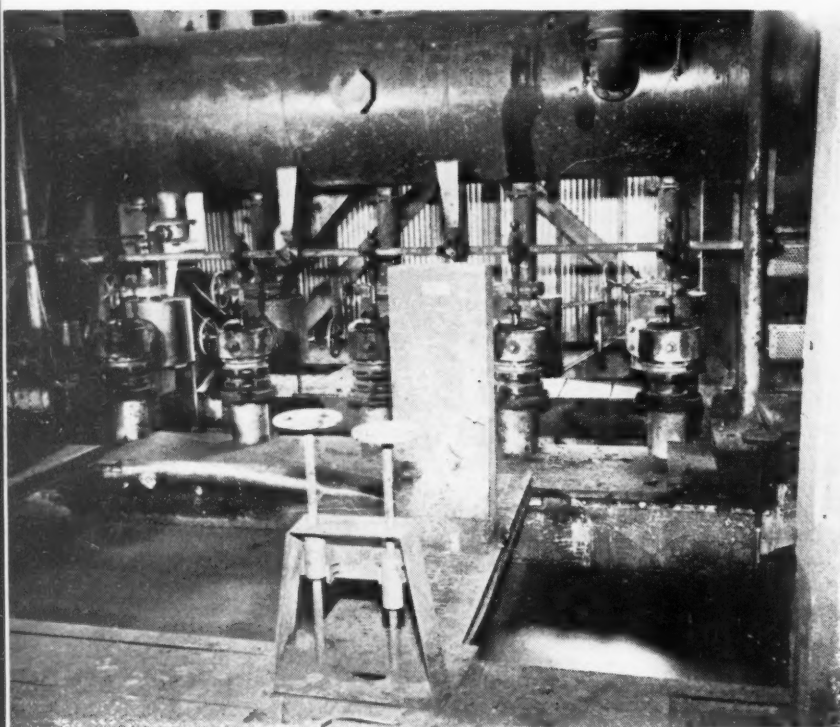
Operation without a man stationed at the elevator where the coal is transferred from shuttle cars to the 5-ton mine cars is a feature of the underground operation. Pushbuttons controlling the car-spotting hoist and elevator are mounted on a post within reach from the driver's seat of the shuttle car. Motor crews attach the head and tail ropes of the hoist to the empty trip ready for the car loading. The shuttle-car driver operates the button controlling the conveyor on his car with one hand and with the other works the two buttons of the hoist and elevator. Experience to date



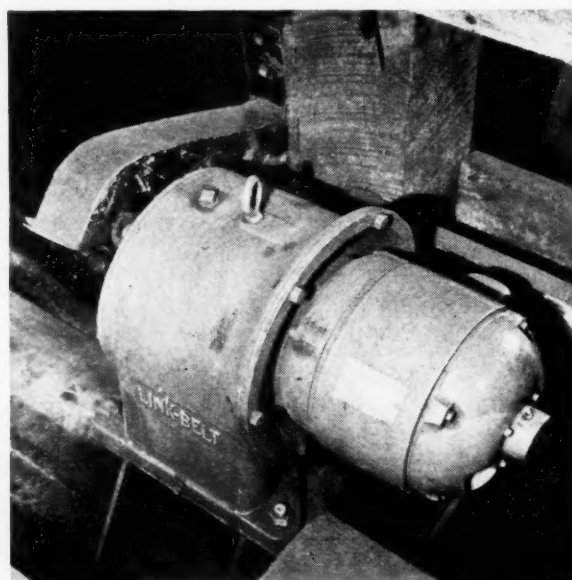
Cars dump themselves into 500-ton bin. Left is the belt gallery and drive house for the rope-and-button conveyor.



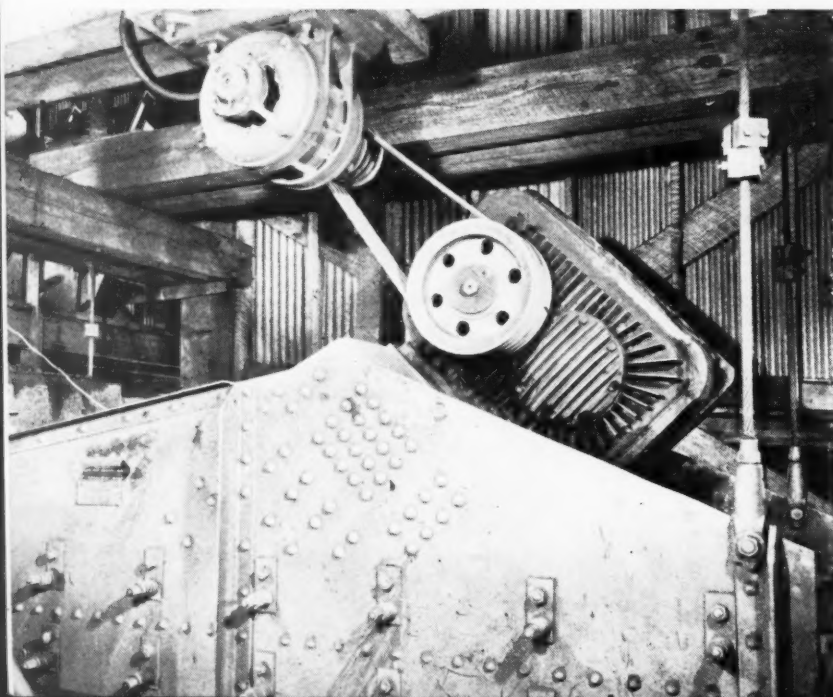
Looking back along the top belt toward the picking belt, where refuse tossed out the window slides to a disposal space in the hollow.



Air-pulsated jig for washing 5x1 1/4-in. coal.



Motorized gear reducer, with new-type 5-hp. 1,750-r.p.m. 440-volt motor, driving washer refuse elevator.



Only vibrating screens are used in Esco No. 10 plant. The unit shown is the 5x14-ft. dewatering and classifying screen driven by a 20-hp. ball-bearing motor through V-belts.

indicates that the shuttle-car operators can be trained to fill the cars to an average load approaching very closely that possible if an elevator man were employed.

Four of the shuttle cars were ordered with left-hand cable reels and four with right-hand, but to save delay it was necessary to accept all eight with left-hand reels. Length of trailing cables is 600 ft. and the first units were received with No. 8 concentric cable. Replacements are being made with No. 6 duplex round, however, because of difficulties in strength, capacity and splicing encountered in the first cables.

Coal is shot down with Liberty "Big Coal D" permissible. Most of the undercutting has been done with plain forge-sharpened bits. However, Borod facing now is being tried. The main entry consists of four 20-ft.-wide headings except that through the 600 ft. of fault the width was reduced to 16 ft. In this bad-top area the center heading was dropped and then was picked up at the inby end. At least 40,000 tons of rock and unmarketable mushy coal from drawing through the fault was hauled outside and dumped on the mountainside.

Car Capacity 194 Cu. Ft.

New-car equipment now consists of 50 American Car & Foundry bottom-dump units: level capacity, 194 cu. ft. Dimensions and general specifications are as follows: over-all width, 7 ft.; over-all length, 14 ft. $\frac{1}{2}$ in.; height above rail, 38 in.; track gage, 48 in.; 14-in. plate-rib wheels with Timken 575-572 bearings; $3\frac{1}{4}$ -to-3-in. axles; 46-in. wheelbase; Lincoln oilers in wheels; one double-acting spring bumper; one wood-filled bumper; no brakes.

Hauling at this development stage is done with one General Electric 8-ton locomotive and a Goodman 10-ton, both of which are reconditioned units. Total maximum haul at present is 3,000 ft. of which 1,200 ft. is on the outside. Rails are 60-lb. All track materials were purchased from the West Virginia Rail Co. Bonds are Type L long steel-arcweld units made by the Ensign Electric & Manufacturing Co., Huntington, W. Va., and all line materials were provided by the Ohio Brass Co.

It is too early, of course, to say much about tonnage per man employed underground. A unit of one loader and associated equipment is operated by a crew of $8\frac{1}{2}$ men.

From the start of development the

Shop, substation, haulage portal and a trip of twelve 5-ton cars with 10-ton locomotive.



Cable-reel shuttle car getting a 5-ton load in a 20-ft. heading.



With his right hand the driver operates the pushbutton for the shuttle-car conveyor. With his left, he reaches the buttons on the post which control the elevator and car-spotting hoist.



mine officials resolved above all to eliminate accidents so far as possible. On June 11, the local newspaper lauded the officials and employees of the mine for a 4-months' operating period without an injury, based on a federal inspection report. All workmen wear hard-toed shoes and hard hats. Cap-lamp equipment consists of 125 Edison Model P units.

To protect men and electrical equipment at the working faces, power distribution boxes (Ohio Brass and Electric Railway Equipment) are used to prevent making wrong connections and abusively overloading motors and

machines. These interlocking boxes forestall making or breaking connections and changing fuses with power on. Boxes must be kept advanced to within 150 ft. of the face because that is the maximum length of cables used on machines. As loading stations are moved every 500 ft., a 350-ft. cable length (Size No. 2) is used to feed the junction box.

Electric power for operating the mine is purchased from the Kentucky & West Virginia Power Co. The one d.c. substation, just outside the drift portal and adjacent to the repair shop (see page 70 of this issue), consists

of a 150-kw. rotary converter with manual starting panels and an automatic d.c. feeder breaker, all of Westinghouse manufacture. The largest electric motor on the job is a 100-hp. unit driving a Diamond hoist on the man-and-materials incline.

R. A. Hedland, with headquarters at Pikeville, is general superintendent of the three mines of the company, and A. O. Coleman, residing at Esco, is superintendent of the Esco No. 10 mine. Preparation at the three mines is supervised by James H. Claggett, and the compensation and insurance problems by F. W. Budde, treasurer.

GETTING MORE AIR

With a Lower Power Consumption

Power Losses Due to Air Leakage and How to Calculate Them—Effect of New Shaft or Other Opening and Shortening of Air Travel on Ventilation Power

By J. H. DICKERSON

Mining Engineer,
Huntington, W. Va.

SALES engineers for manufacturers of ventilating equipment frequently offer suggestions which result in large savings to their customers but they seldom have time to make a thorough study of local conditions at a mine and there is much that affects the cost and efficiency of mine ventilation that is beyond the control of the fan manufacturer.

Such a manufacturer, to offer a somewhat extreme example but one nevertheless exemplifying conditions found in varying degree in many mines, recently was requested by wire to send a salesman at once to a mine where a new fan was thought to be needed. At the office, the salesman was told they could not get enough air to turn an anemometer in the face sections. Inquiry disclosed that the stoppings were built of gob several feet thick and plastered on one side "so that they could not leak." Entering the mine, the salesman found that half the air was lost within 600 ft. of the drift mouth. Knowing that a new fan would not correct the trouble, he recommended good concrete stoppings. These were built and the fan the man-

agement had condemned is now ventilating the mine satisfactorily.

Gob stoppings seldom are airtight even when well plastered on one side, as the gob tends to disintegrate and settle, cracking the plaster. In addition, the plaster often is little more than a coat of whitewash. While the example given is exceptional, the U. S. Bureau of Mines found* that over 60 percent of the mines it checked in one State had over 80-percent leakage between the fan and the face sections, meaning a power loss of about 96 percent for the air actually delivered to the face.

If leakage is materially reduced, the quantity of air to the face sections and the power will be increased unless the fan is slowed down or its adjustments changed. More power is required for the same air at the fan after leakage reduction because a larger part of the air travels the full distance and more work is performed, but the power required for air delivered to the face without leakage always is less than for

the same delivery with considerable leakage en route. If fan requirements are materially altered by changes in leakage conditions, a new fan may be desirable for efficiency. With some of the newer fans, however, the quantity of air may be adjusted without changing the speed, and these fans show a high efficiency over a wide range of deliveries.

To make an estimate of the power loss due to mine leakage it first is necessary to have actual readings of air pressures and quantities at various points. Formulas for the calculations are not available generally, but the writer has prepared the following, with accompanying examples.

Problem No. 1—Present workings begin at D, Fig. 1, 6,000 ft. from the fan at A. It is assumed that the intake and return headings are equal in number and uniform in size between these points. The pressure at the fan is 3 in. w.g., and a 1-in. w.g. pressure is required inside Point D. Therefore, there is a 2-in. pressure drop between A and D. The input at A is 100,000 c.f.m. At B, 2,000 ft. inside, it has been reduced to 70,000 c.f.m. by leakage; at C, 4,000

* "Mine Ventilation Stoppings," R. Y. Williams, Bulletin 99, U. S. Bureau of Mines.

ft. inside, to 50,000 c.f.m.; and at D, to 40,000 c.f.m. What is the power loss due to leakage?

Air readings showed a loss of 30,000 c.f.m. between A and B, but exactly where this occurs cannot be determined without additional readings, which would take time and lengthen the calculations. The mean, or average, quantity of air between these points therefore will be used as the average handled by this section—viz., 85,000 c.f.m. Between B and C, the average is 60,000 c.f.m.; between C and D, 45,000 c.f.m. These mean, or average, quantities are for equal sections where rubbing surface, areas and coefficients of friction are the same. Therefore, these factors need not be considered.

In the method to be used in this problem there is a slight allowance for decreasing leakage between two points, such as A and B. The square of the mean air quantity in any section divided by the total of the squares of the mean quantities for all the sections represents the proportion of the total pressure used in any section. Since the relations will remain the same, the air volumes may be divided by 1,000 to get numbers more convenient to use. They could be made smaller by dividing by 5,000, but we will square 85, 60 and 45 and add the results, which gives 12,850. The square of 85 is 7,225 and this number divided by 12,850 and multiplied by 2 in. gives a water gage of 1.125 in., or that part of the total pressure used between A

and B. In like manner, the drop from B to C is determined to be 0.56 in. w.g., and from C to D, 0.315 in.

It is not necessary to find the percentage of power used between A and B, but it may be obtained as indicated in Fig. 1, which shows 66.7 percent. If 40,000 c.f.m., the actual quantity of air delivered from A to D, were delivered without leakage in these same entries, the pressure from B to C would be reduced from 0.56 in. to 0.249 in. w.g., since 60 squared is to 40 squared as 0.56 in. is to X. X therefore equals 0.249 in. With the same quantity of air it would be the same for the other two sections, so the total pressure would be 3X, or 0.747 in. w.g., says 0.75 in., in moving 40,000 c.f.m. from A to D and return.

The power to move 100,000 c.f.m. with 60,000 c.f.m. leakage in the mine is represented by 100 multiplied by 2 in.; for 40,000 c.f.m. without leakage, 40 multiplied by 0.75 in. With 100 percent as the power required for the first condition and Y for the 40,000 c.f.m. without leakage, then 100 multiplied by 2 is to 40 multiplied by 0.75 as 100 percent is to Y. Y therefore equals 15 percent. This is the percentage of the power used for 100,000 c.f.m. with 60,000 c.f.m. leakage that will deliver the same quantity (40,000 c.f.m.) to the last crosscuts without leakage. The power loss due to leakage therefore is 85 percent.

If the same data were used and the problem was figured on the basis of six

sections, the indicated power loss would be a fraction of 1 percent greater, but the result as calculated is close enough for practical purposes. If greater accuracy is desired, air-quantity and accompanying pressure readings should be taken more frequently.

Problem No. 2—In Problem No. 1 it was shown that 15 percent of the power required for 100,000 c.f.m. at a 2-in. w.g., with leakage of 60,000 c.f.m., would deliver 40,000 c.f.m. from A to D and return without leakage. If there are no workings ahead of D, what will be required for 100,000 c.f.m. at D without reducing leakage? In this case, 40,000 cubed is to 100,000 cubed (or 2 cubed is to 5 cubed) as 15 percent is to X. The answer therefore is 234 percent plus. To get 100,000 c.f.m. to the face without reducing leakage would be prohibitive, as it would require at least $2\frac{1}{2}$ times more air at the fan, increasing the water gage from 2 to $12\frac{1}{2}$ in. and the power requirements by 1,562½ percent.

Problem No. 3—This problem is substantially the same as No. 1 except that the stoppings are better in the first section and the leakage is farther on. The readings are 100,000 c.f.m. at A, 90,000 at B, 70,000 at C and 40,000 at D. The averages, or means, will be in proportion to 95, 80 and 55. The squares will be 9,025, 6,400 and 3,025; total, 18,450. The pressure for Section B-C will be 6,400 divided by 18,450 and multiplied by 2 in., or 0.694

Fig. 1—Ventilation diagram for Problem No. 1 showing air and pressure readings and certain calculated data.

Fig. 2—Ventilation diagram for Problem No. 5 showing observed and calculated data.

Figs. 3 and 4—Ventilation diagrams before and after sinking shaft for shorter one-way air travel.

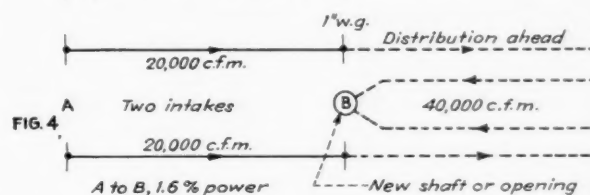
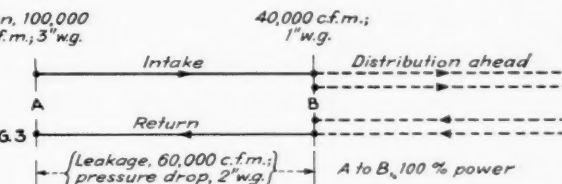
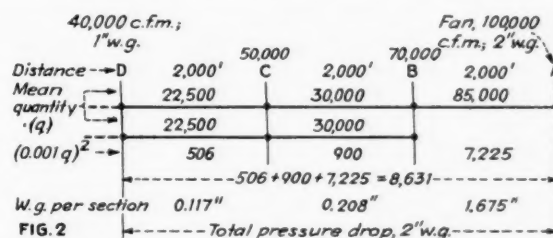
Readings on return airway. Equal areas from A to D and return.

40,000 c.f.m.; 1" w.g. 50,000 70,000 Fan, 100,000 c.f.m.; 3" w.g.

Distance	D	2,000'	C	2,000'	B	2,000'	A
Mean quantity (q)		45,000		60,000		85,000	
(0.001q) ²		2,025		3,600		7,225	
		2,025 + 3,600 + 7,225 = 12,850					
W.g. per section		0.315"		0.560"		1.125"	
		Total pressure drop, 2" w.g.					

Pressure Drops		% Total Power per Section	
7,225 ÷ 12,850 × 2" =	1.125"	85 × 1.125" = 95.625	66.7% A to B
3,600 ÷ 12,850 × 2" =	0.560"	60 × 0.560" = 33.600	23.4% B to C
2,025 ÷ 12,850 × 2" =	0.315"	40 × 0.315" = 12.600	9.9% C to D
Total, A to D =	2.000"	143.400	100% A to D

FIG. 1



in. w.g. for 80,000 c.f.m. For 40,000 c.f.m. it will be one-fourth, or 0.1735 in., and for the three sections it will be 0.52 in. Then 100 multiplied by 2 in. is to 40 multiplied by 0.52 in. as 100 percent is to X. X therefore equals 10.4 percent, the power required to move 40,000 c.f.m. without leakage. Therefore, the power loss in moving 100,000 c.f.m. with 60,000 c.f.m. leakage is 89.6 percent.

Problem No. 4—The leakage in this problem is the same as in No. 1, but the pressure readings have been taken at Points A, B, C and D, so the number, length, size and condition of headings need not be uniform. In this case, it is necessary to calculate the pressure required for moving 40,000 c.f.m. without leakage for each section and then add the results to get the total pressure. The pressure readings are: A, 3.5 in.; B, 1.25 in.; C, 0.75 in.; D, 0.5 in., making the total pressure drop from A to D 3 in. w.g. The following calculations show that the pressure drop for 40,000 c.f.m. from B to C is less than half that for the first section. This may be due to a shorter section, more headings, larger areas, splits or other causes.

85° : 40° :: 2.25 in. : X.
 X=0.498 in. w.g. for Section A-B.
 60° : 40° :: 0.50 in. : Y.
 Y=0.222 in. w.g. for Section B-C.
 45° : 40° :: 0.25 in. : Z.
 Z=0.198 in. w.g. for Section C-D.

Power Loss 87.8 Percent

The pressure drop for 40,000 c.f.m. from A to D without leakage therefore is 0.918 in. w.g. Again using proportion, 100 multiplied by 3 in. is to 40 multiplied by 0.918 in. as 100 percent is to X. X therefore is 12.2 percent, or the percentage of power required to deliver 40,000 c.f.m. without leakage, compared with 100,000 c.f.m. with 60,000 c.f.m. leakage. The power loss therefore is 87.8 percent.

Problem No. 5—The conditions are the same as in Problem No. 1, except for splits starting at B (Fig. 2). As the air from B to D will move in two airways and there is only one set from A to B, the pressure drop from B to C, and from C to D, will be only one-fourth that from A to B for the same quantity of air. With no leakage, the pressure drop from A to B for 40,000 c.f.m. will be 0.371 in. w.g. (derived from solving for X in the proportion 85 squared is to 40 squared as 1.675 in. is to X). From B to C it will be $\frac{1}{4}$ X and the same from C to D. The total pressure will be $1\frac{1}{4}$ X, or 0.556 in.

plus. Then 100 multiplied by 2 in. is to 40 multiplied by 0.556 in. as 100 percent is to Y. Y therefore is 11.1 percent and the power loss in circulating 100,000 c.f.m. with a leakage of 60,000 c.f.m. is 88.9 percent.

Problem No. 6—This problem is offered to show how a new air shaft or other outside opening affects the ventilating situation. Three factors combine to reduce the power required. In Fig. 3, the output of the fan at A is 100,000 c.f.m., but as the leakage is 60,000, only 40,000 c.f.m. reaches the location of the proposed air shaft at B. If only 40,000 c.f.m. is required at B and it does not have to return from B to A, leakage automatically is eliminated without improving the stoppings and the length of the air travel between A and B is cut in half. With double the number of intake airways, as provided in Fig. 4, the power required is further reduced by 75 percent.

New Opening Cuts Power

The calculations for this problem are as follows: With 70,000 c.f.m. as the mean quantity of air in the intake in Fig. 3, 70 (or 7) squared is to 40 (or 4) squared as 2 in. w.g. is to X. X therefore is 0.65 in. w.g., the pressure required for 40,000 c.f.m. without leakage from A to B and return (Fig. 3). Turning to Fig. 4, 0.65 in. w.g. times $\frac{1}{2}$ times $\frac{1}{2}$ equals 0.08 in. w.g. in moving 40,000 c.f.m. from A to B (one way). Then 100,000 multiplied by 2 in. is to 40,000 multiplied by 0.08 in. as 100 percent is to X. X therefore is 1.6 percent, or the power required to move 40,000 c.f.m. without leakage through the doubled airway from A to B one way as compared with moving 100,000 c.f.m. with 60,000 c.f.m. leakage from A to B and return as shown in Fig. 3.

The new opening and airways arrangement shown in Fig. 4, which eliminates leakage, reduces travel and doubles the airways in one direction, thus provides for delivery of 40,000 c.f.m. at B with a power saving of 98.4 percent, excluding the power necessary to get the air through the new opening or shaft. If the length of the new air shaft or opening is short and the area is ample, this is a small item. While Fig. 4 shows the air delivered at B to be used in new workings inside, this is an additional power requirement which is the same in either case and does not affect the problem.

Problem No. 7—This problem, similar to the others, is not difficult. If a shaft is used for both the intake and return air and leakage through the cur-

tain wall is 30 percent, what will be the power loss for the 70 percent delivered to the mine, assuming the air loss is uniformly distributed, the water gage is 0.4 in. and the fan delivers 100,000 c.f.m. to the intake? Other figures would answer the purpose, of course.

The average quantity of air in the downcast is 85,000 c.f.m. Then 85 squared is to 70 squared as 0.4 in. is to X. X therefore equals 0.27 in. w.g. for 70 percent of the air without leakage. Then 100,000 multiplied by 0.4 is to 70,000 multiplied by 0.27 as 100 percent is to X, making X 47.2 percent. This part of the power required to move 100,000 c.f.m. with a 30-percent leakage will deliver 70,000 c.f.m. to the mine without leakage, so there is a power loss of 52.8 percent due to leakage in the curtain wall.

Problem No. 8—If the input to a mine is 100,000 c.f.m. with a 2-in. w.g., and then the mine resistance is increased by falls, etc., so that the water gage must be raised to 2.5 in. for 100,000 c.f.m. at the fan, what will be the leakage? The theoretical answer is likely to be less than the actual leakage, with the increased pressure causing new leaks or enlarging old ones, but for the same openings the leakage can be found by solving for X in the proportion 2 in. is to 2.5 in. as 30,000 squared is to X squared. X therefore is 33,540 c.f.m.

Leaks Waste Power

Other problems might be given to exemplify savings through reducing resistance, relocating fans and inlets and outlets, installation of auxiliary fans, etc., but the writer will rest with one more showing the effect of air leakage. Let us consider a mine with a leakage of 60 percent between the fan and the face, and the same workings where improved stoppings throughout have reduced the leakage to 20 percent. In the first case there would be less pressure and power required for the same quantity of air at the fan, but only half as much air at the face. To get as much air at the face with 60 percent leakage as with 20 percent would require double the regular input to the mine, assuming the increased pressure did not result in new leaks. This would necessitate four times the pressure and eight times the power. In many cases, this would be prohibitive for practical as well as economic reasons. Nevertheless, fans often are speeded up without reducing the leakage to get a little more air at the face, resulting in increased leakage and excessive power consumption.

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To Complete Fire Extinguishment

Introduced Through Air Locks by Men Wearing Breathing Apparatus and Carrying Life Lines to Assure Orientation in Fog From Condensed Moisture; Dry Ice Made Atmosphere Incombustible

DRY ICE, which is carbon dioxide frozen to a solid, evaporates to a dense cold gas that travels slowly, stratifies and does not readily diffuse, being intrinsically heavy and still heavier and less mobile because it is cold. It seems ideally designed to blanket a fire and form a barrier to the entrance of air—far better than the hot inert gases from the mine fire itself, for the nitrogen gases of such a fire are light and warm and even the carbon dioxide is so heated as to be lighter than surface air. Properly used, dry ice should be an excellent fire-fighting medium—at least where applied near the fire.

Adequate Sealing Difficult

It has been so used at the mine of the Alden Coal Co., Alden Station, Newport Township, Luzerne County, Pa., in the southern end of the northern anthracite region. The fire that needed extinguishment occurred in the Cooper bed, a split of the Mammoth, in a 25-acre area of a mine that has been moving and throwing weight for many years, where the coal pitches heavily and where removal of pillars and mine caves have made adequate sealing difficult.

The Cooper bed is said to be notorious for the high temperature of its workings and for its many underground fires, which probably are of spontaneous origin, though with steep outcropping beds, mischievous boys and industrious men who fire surface rubbish heaps, one cannot always be sure that underground fires do not have a surface origin. Some have been known to start in that manner. The coal from the Cooper bed also is disposed to heat when stocked to great depth.

Already the mine at Alden Station

has had two fires, now either dormant or extinguished. It is almost certain, however, that this fire was a new one and not a continuation of one of the other two in the same bed. Because of its location near the return air current of the colliery, it was deemed advisable to withdraw all the men from the mine, especially as the mine had a methane content that had been noted more than once to be such as might cause an explosion.

After sealing and the use of fire-extinguishing liquids, under the direction of a group of mine inspectors and mine officials, the fire seemed either wholly or nearly extinguished, but, as a factor of safety was necessary and as the oxygen content in the fire area was 20 percent, which is little removed from that of surface air, it seemed desirable to introduce dry ice to make the extinction of the fire doubly sure. Almost three tons (5,900 lb.) of this solid carbon-dioxide product was placed by hand behind the seals on April 20. Dry ice is purchasable in cakes weighing more than 100 lb. for 3c. a pound; a 50-lb. cake is 10 in. square. Every pound of dry ice produces 9 cu.ft. of carbon dioxide, so every 50-lb. cake delivers 450 ft. of that gas and 5,900 lb., 53,100 cu.ft.

Extreme care must be used in handling the product as it begins to evaporate rapidly and, as the gas is carbon dioxide, those handling the cakes should be protected by oxygen-breathing apparatus. Moreover, after it has been evaporating for some minutes, the reduction of temperature in the atmosphere of the mine creates a dense fog, so that workers entering the vicinity to test the air or to perform any other service should be equipped also with a life line.

About 72 hours after the introduction of the dry ice, the oxygen content dropped from 20.0 to 6.8 percent. Five days later, at which time the cakes had entirely turned to gas, the oxygen content was still only 10 percent, and seven days later the content was no higher. Though it is doubtful whether the area was tightly sealed, the ice was introduced near a seal back of the fire area and, because of its weight, it could not readily escape.

First Use of Dry Ice

This is said to be the first use of dry ice in fighting a mine fire in the anthracite region, perhaps the first time it has been used in the world except where Cardox tubes have been utilized, as by the Pittsburgh Coal Co. (*Coal Age*, March, 1941, p. 59), though carbon dioxide as a gas from tanks and possibly other sources has been pressed into service, but the care needed to guard against accident in using the gas as dry ice or any other form is well illustrated by an experience of an executive in New York city, who, finding the air-conditioning system inoperative, placed a cake of dry ice in front of a fan to keep the meeting room cool and thereby promptly made the air unbreathable.

When a fire begins to decline the temperature of the area surrounding it is lowered, the atmosphere contracts and external air is drawn in. Adding dry ice provides gas to fill the space due to atmospheric contraction or, more exactly, to restore the pressure thus resulting. In this way, the fire is fed with carbon dioxide instead of air, and its loss of temperature does not furnish a means for its own re-establishment.

MEN AND METHODS JOIN

To Keep Castle Gate No. 2 Equipment on the Job

Maintenance Arranged to Complement Complete Mechanical Mining and Preparation—Enlarged Shop Serves Both Top and Underground Workings — Preventive Methods Stressed in Inspection and Repair

By IVAN A. GIVEN
Associate Editor, Coal Age

MEN CONSTANTLY on the job underground and in the preparation plant backed up by comprehensive shop facilities are the keynotes in maintenance work at the Castle Gate No. 2 mine of the Utah Fuel Co., Castle Gate, Utah. Completely equipped with the latest-type crawler loading machines and auxiliary equipment (all permissible), Castle Gate No. 2 also is served by a complete washing, screening, drying and blending plant put into service Feb. 13, 1940, to supplement the original tippie and make possible shipment of a uniform product with improved combustion characteristics (Coal Age, June 1940, p. 41; July, p. 36). Capacity of the plant is 250 tons per hour, with sufficient reserve to handle 400 tons per hour in the future by the installation of additional washing and drying equipment.

Maintenance of surface equipment and operation of the shop is in charge

of Earl Warren, master mechanic. Inspection, lubrication and repair of underground equipment, with the exception of cars, certain locomotives, etc., which come to the outside is handled by a repair force headed by Hal Taylor, chief electrician. No shops are maintained underground, as all overhauling and certain major repair jobs are done in the shop near the tippie. However, if it is a question of repair or the replacement of parts requiring as much as two or three days' time, the work normally is done in the working section by the underground maintenance force.

Seven 11-BU Joys, one a spare, head the list of underground equipment. The first started work in 1936. These crawler machines are supplemented by a Goodman 260 track loader and four Goodman shaker conveyors with duckbills, with four more of the latter about to go into operation at the time the data were gathered for this article. Cutting equipment comprises seven Sullivan 7-AU track-mounted machines each carrying a Sullivan CD-14 drill, three 7-B

shortwalls (three more coming), one spare CE-7 and three Goodman 512's. The track machines are fitted with 9-ft. bars and the shortwalls with 8-footers. Drilling where shortwalls are employed is handled by 14 Dooley post-mounted machines. The cutters use Bowditch chains and throwaway bits. The drill bits are Coalmaster, which are tipped with Borod in a special water bath with the additional protection of a strip of asbestos on the top to prevent the heat running back into the bit shanks and changing the characteristics of the metal. Three to four regrinds usually may be had before retipping is necessary.

Haulage at Castle Gate No. 2 is handled by 14 8-ton Westinghouse battery locomotives (gathering service) including spares, seven 13-ton secondary and relay locomotives (trolley type) including spares and three 20-ton General Electric main-liners, one a spare. Ten extra 48-cell MVA 544-amp.-hr. Exide-Ironclad batteries are kept on hand to permit changing during the shift. For this purpose, special changing and charging racks (p. 69 of this issue) are provided.

Except for trolley locomotives, mine equipment is powered by 220-volt alternating current. Special portable power units made at the mine are employed for both underground battery charging and face service. These units consist of three 15- or 25-kva. transformers, supplemented by a few 50's, mounted in standard steel cars (wood bottoms) along with the necessary junction and control equipment.

Portable transformer and charging cars, made from standard mine cars, in service in Castle Gate No. 2 mine.



Side openings closed by bolted plates are cut in the cars as required, while welded steel covers provide additional protection. Thus, the transformers can go anywhere a mine car can be taken, facilitating keeping the power source close to the working face. Good voltage is the result, with consequent improvement in both operation and maintenance.

The Westinghouse modified constant-potential charging units used underground are made portable in similar fashion, as well as gathering pumps and certain other equipment. Since mine cars are simple and durable, the maintenance on such chassis is very low.

One mechanic stays in each working section each shift to handle underground repair work at Castle Gate No. 2. In addition, two men on the night shift take care of those battery locomotives which remain underground, including inspection, greasing, watering, charging and controller repairs. As indicated previously, practically all the repair work, including 2- or 3-day jobs, is done underground by the regular repair force. However, a Harvey truck, developed by Tom Harvey, former general superintendent of the Columbia Steel Co. mine, Columbia, Utah, is available for moving machines and other equipment which must be taken outside or long distances inside the mine. In those exceptional cases where power cannot be used and the machine must be taken out, it is loaded with chain blocks onto the truck.

Mechanics Also Lubricate

In addition to machine repairs, the mechanics take care of lubricating parts difficult to get at, as well as all cable and wire work. Other greasing is handled by the machine helper. While a vulcanizer is on hand, splices usually are made with a layer of gum-faced rubber followed by P & B paraffin tape. When five or six splices have been made in a cable, it is taken off the machine and used for connections to nip boxes. Or if there are good 50- or 75-ft. sections, they may be installed in another cable to eliminate a length containing several splices or used in extending a shortened cable to standard length.

Reports and hold-over jobs are reduced to a minimum at Castle Gate No. 2 by having repairmen stay over, at time and a half, to take care of anything wrong with a machine that must work the next shift. Normally, such jobs are short, but, in addition



Helper lubricates a loader while the section mechanic inspects and adjusts.



Some of the stock of repair parts kept in the supply room close to the working sections.

to reducing reporting, this practice insures that a machine is ready to perform when the next shift comes on 24 hours later, unless the difficulty is of a major nature, in which case the spare machine is brought in.

Each evening, between the first and second shifts, the chief electrician meets with the mechanics, helpers, motormen and others concerned for reports on machine condition and possible repairs which may be required, passing on the necessary information to the night-shift men. In the case of the latter, reports are depended upon to apprise the chief electrician, the day mechanics and others of things which must receive attention.

Outside such items as work benches and tool boxes for section mechanics, no shop facilities are provided underground at Castle Gate No. 2. As stated, repairs are made in the working places. However, an inside store-room is stocked with a complete line of parts usually needed to facilitate repair work, including two main gear boxes for loading heads; jack cylinders, ropes, jacks and hose; main bracket arms; plenty of gathering arms; disks, chains and flights; all types of bearings for all machines; extra shafts and axles, large and small; extra hydraulic pump and extra cases for use in rebuilding pumps; sprockets and gears of all kinds, controller parts; blocks, straps and rivets for rebuild-

ing cutter chains, etc. A complete catalog file also is kept in the mine so that mechanics can refer to the proper numbers in listing their needs for new parts to replace those used in repair jobs. These lists are handed to the chief electrician, who orders the needed parts and materials immediately. Parts and sub-assemblies removed from all types of machines are sent to the outside shop for salvage and rebuilding, after which they are placed in stock for further use.

The unusually comprehensive surface shop facilities at Castle Gate No. 2 reflect, among other things, the fact that the operation is rather far removed from independent commercial shops able to handle heavier repairs, as well as from the usual sources of supplies and parts. Additions recently made now enable this shop to take care of practically any repair, rebuilding or manufacturing job necessary to keep the equipment on hand in service.

Included in the shop facilities are

a car department, blacksmith shop, welding shop, machine shop and plumber's shop, the latter largely for town use, although its facilities and staff of two are available for work around the top works and elsewhere when necessary. The machine shop was built in 1933 and was enlarged by construction of an addition on the south end in the fall of 1941 to make a bay 57 ft. long and 45 ft. wide.

Car-department equipment includes a drill press, saw and two 2-ton chain blocks, the necessary tools, grease guns, etc., and a 50-hp. 2-stage Ingersoll-Rand compressor, plus a 90-hp. General Electric charging panel capable of handling four 544-amp.-hr. batteries at a time. All car-repair work except straightening is done in this shop, normally staffed by four men. When straightening is required, the car is run into the machine shop, where one of the pits is equipped so that heavy eyes may be screwed into receptacles in the floor at any one or more of the four corners. By

chaining or hooking the car to these eyes as required and using the overhead crane, practically any straightening job may be accomplished with a minimum of effort and time without heating.

With a present daily output of approximately 3,600 tons (two shifts), Castle Gate No. 2 operates 384 steel cars with wood bottoms. The capacity is about 4 tons. All are equipped with chilled cast-iron wheels, 150 with Card solid-roller bearings and the remainder with Timkens. An Alemite system, including electric barrel pump and two gun outlets with meters, is installed on the loaded track outside for lubrication, using Conoco light or medium pressure grease. Card bearings are greased about every three months; Timkens every six months, with very few failures. Bearings are adjusted in the shop as the cars come in for other repairs or inspection. Each car is numbered and a record is kept of the date and repairs or adjustments made each time it comes in.

Wheel life is increased and material conserved by welding up flat spots with Lincoln 7 electrode and then grinding by hand. Possibly because of the use of shoes on the steep grades, which normally are placed on one side of the trip, car axles tend to groove on one end. Formerly, worn axles were built up by welding and then turned to size. A shortage of rod, however, has resulted in sawing axles in two and then welding good ends together in the center to make a usable unit. Rejected axle ends are worked up into pins and other similar items.

Shops Fully Equipped

The blacksmith shop, serving all others as needed, includes two forges, trip hammer, grinding wheel, Sullivan drill sharpener and heater and auxiliary equipment.

Three pits are included in facilities in the machine shop. One, as detailed previously, is equipped for car straightening. Other equipment includes a Sullivan 5½x6 spare and extra compressor, 150-ton hydraulic press, 18-in. long-bed Cincinnati lathe capable of handling a 16-ft.-long shaft, 24x48 double-spindle McCabe lathe, band saw, two drill presses, planer, shaper, bolt and pipe machine and two grinding wheels. In the west bay, where the lathes are located and armature winding is done, including work for the company's Sunnyside and Clear Creek operations, is a hand crane with two 2-ton hooks. The main bay is served by two mine-made traveling

Bay for armature winding (left) and lathe work. Castle Gate shop.



The new section of Castle Gate shop is equipped with pits and overhead cranes.



cranes, one on each side. The hoists were made from 4-ton Shepard-Niles boom hoists with extra blocks increasing lifting power to 12 tons. The traveling motors are Dooley 462 drill motors, and a Dooley reverse switch is used to control crane travel.

The shop force is nine men on the day shift and three at night, with extras as needed. The total includes one armature winder, two lathemen and two electricians, with mechanics and repairmen making up the remainder.

Equipment in the welding shop comprises a saw, grinding wheel, one 300-amp. Stable-Arc welder, one 300-amp. General Electric welder, tank gas equipment, and the necessary work tables, stands, tools, etc. Electric welding is used wherever possible. Two welders work on the day shift with an assistant grinding drill bits and doing other necessary work. An additional two welders, without helper, normally take care of night jobs. When necessary, these welders are available for underground work.

Alloy Shafting Helpful

Standard renewal parts normally are employed in repair work at Castle Gate No. 2 with standard National coils in armature winding. Asbestos or other special wiring has as yet not been found necessary in any great quantities. Alloy shafting (Lehigh "Croma") has been found to yield a substantial saving in parts and repairs, and is used for all armature and machine shafts and axles. For certain services, heat-treated bolts also are employed.

Loading machines are scheduled for a complete overhaul every two years, usually in the summer. In overhauling, the spare machine goes into regular service, while the one to be gone over is brought out to the shop and torn completely down for inspection, replacement and repair of all parts. As with parts taken out in mine repairs, rebuilding is done in the shop either for reinstallation on the machine or return to stock. Such an overhauling job normally takes two men about four weeks, one shift a day.

Cutters are less subject to wear than loading machines, and the usual jobs are relining and riveting bars and repairing chains. Shoes are built up with Una 700 rod and new straps are installed as necessary. Extra motors, particularly in the case of shortwall machines, are kept on hand, so that if one burns out it can be replaced with a new one and the old brought

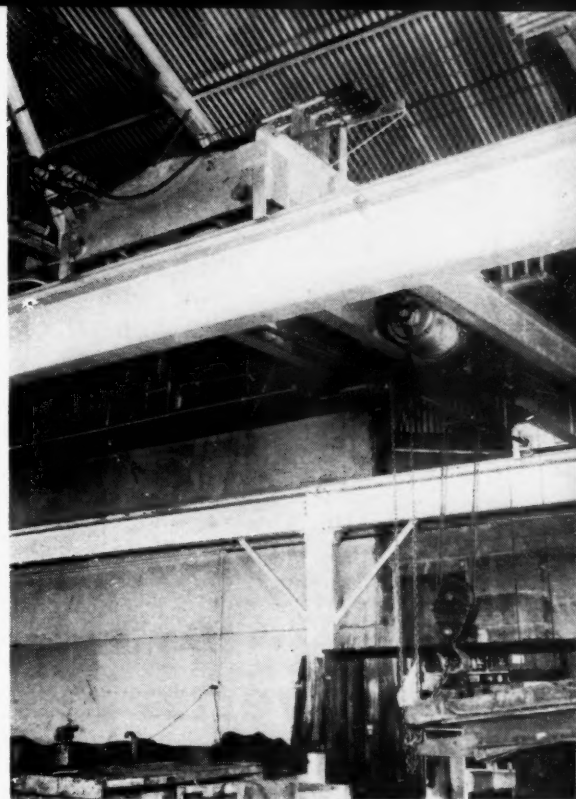
out for rewinding and reconditioning. Drills are overhauled once a year, including installation of new parts as necessary.

Locomotives are inspected, lubricated and tightened up once a day, either underground or outside, depending upon where they wind up at the end of the shift. The overhauling schedule is once a year for battery equipment and once every two years for trolley units. All battery machines are equipped with ball-bearing armatures and all trolley machines are being converted from sleeve to SKF ball units. In this latter operation, the same end bells are used after being bored out and sleeved up to take the new bearings. Croma axles and shafts are used throughout.

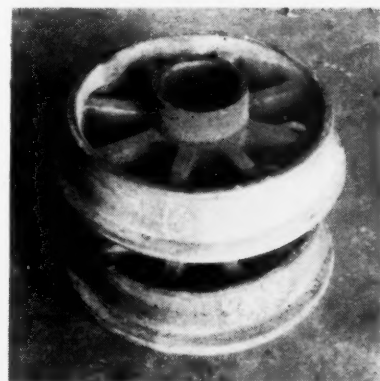
Shoe-type current collectors are used for arc reduction and smoother operation. Brake systems have been revised to increase hanger-bolt surfaces and reinforce and enlarge pins and straps to prevent breakage. Axle thrust plates have been changed to the outside, the necessary bearing reconstruction being done in the Castle Gate shops. Tire practice is based on turning after normal wear. In case flat spots 3 or 4 in. long develop, however, they are built up with Lincoln 7 rod and then ground to the correct profile. Keystone wool

Flat spots on car wheels are built up and ground, if necessary to standard profile. The same practice is followed with locomotive tires and wheels.

A new car axle is made by welding two good halves of old axles together.



Showing the traveling motor and other details of one of the two shop-made overhead cranes.



yarn is used in sleeve bearings and journals and is re-oiled with liquid grease. Ball bearings are lubricated with Conoco "Lubriplate."

Washer and tippie repairs normally are handled by two men who go on at 3 p.m. with another two starting at 7 p.m. Systematic checking and lubrication has kept bearing failures at zero in both tippie and washer since the latter was built. This

checking and lubrication is handled by one man in the tippie and one in the washer each operating shift. These men proceed by charts prepared for the washer by the Utah Oil Refining Co. and the tippie by the master mechanic. These charts are supplemented by a regular cleaning schedule for certain motors subjected to more than normal dirt conditions, with longer intervals for mo-

tors in normal locations. Cleaning keeps rings free and working—another factor in low maintenance. Keystone light oil is used in ring-oiled bearings the year around so that they will start any time regardless of the temperature and with assurance that lubrication will not fail. The oil is changed at regular intervals and the dates are noted just above each motor as a guide.

CAN IT BE USED?

Governs Pittsburgh Coal Salvage Work

Salvage of Equipment and Materials Coordinated Under Centralized Control—Primary Consideration Is Repairing Equipment or Material or Putting It to Other Use—Unneeded Material Sold to Others

By **R. W. MACKENSEN**

Purchasing Agent and Chairman
Salvage Committee
Pittsburgh Coal Co.

EFFORTS of all operating departments of the Pittsburgh Coal Co. have been coordinated under centralized control to increase the salvage of materials and equipment. While work of this kind always has been important as an economy measure and as a means of better housekeeping, with consequent improved safety conditions, it has been greatly intensified by war needs.

The salvage work of the Pittsburgh Coal Co. is unique in that it is not confined to the collection, sorting and disposal of mere scrap. A primary consideration is: Can this equipment or this material be repaired or put to some other use? This policy is particularly important at present since re-use of material removes a burden from important metal industries. In many cases the policy has been extended so that usable equipment or material not needed in the company's own operations is sold to other organizations which can put it to work.

In March, 1941, a scrap and salvage committee was organized to improve the handling of this work. This committee is composed of R. W. Mackensen, purchasing department; S. M.

Parnley, engineering department; J. C. Bartram, production department; E. P. Lovett, maintenance department; and G. C. Kelley, general storehouse. The committee meets at the call of the chairman to consider all scrap and salvage matters presented by all departments. Obsolete or useless items not suitable for salvage or transfer to other departments are ordered scrapped. Any items which cannot be used or sold to someone who can use them are immediately scrapped. The membership of the committee provides a cross-section of the departments using operating items of materials or equipment.

Under present critical needs, scrap sales are made when as little as one or two truckloads are available.

For a number of years, as a part of our regular operating routine, our reclamation engineer has made regular underground inspections, reporting on "loose materials in working sections" as well as on "material in place in idle sections." If material in idle sections is not likely to be used reasonably soon, it is transferred to working sections. This has been helpful under the present scarcity of materials. Recently the reclamation engineer's surveys have been extended to include a report on "scrap" both underground and above ground. To an important extent these reports have been responsible for the

increased tonnages of scrap being sent to markets.

Containers have been placed underground with painted slogans on them such as "Place your scrap here to lick the Japs." As these are filled they are loaded into mine cars and hauled to the surface. Similar containers are scattered throughout the general shops at Library, Pa. These are labeled brass, copper, babbitt metal, turnings, etc. General steel turnings are wheeled to a large outside bin. Recently this bin has been segregated with a special compartment for nickel alloy steel.

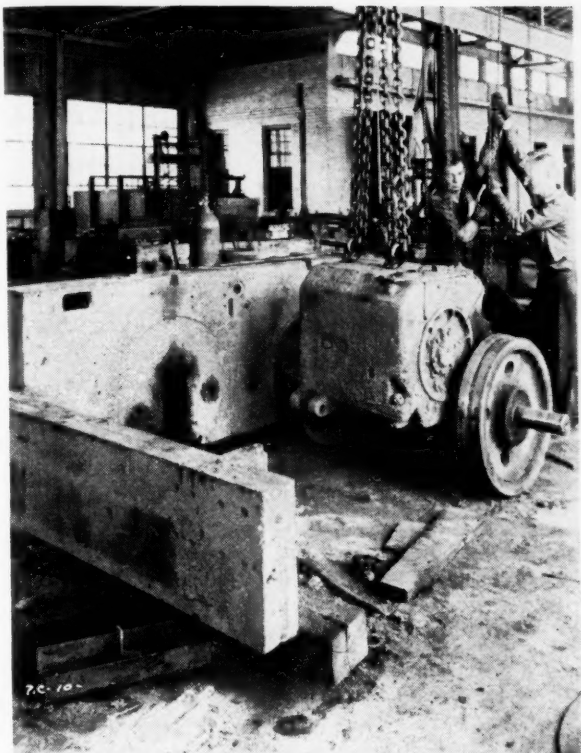
During 1941 the following scrap was sold:

Iron and steel . . .	3,603,082 lb.
Copper, brass and bronze	105,566 lb.
Manila rope	8,076 lb.

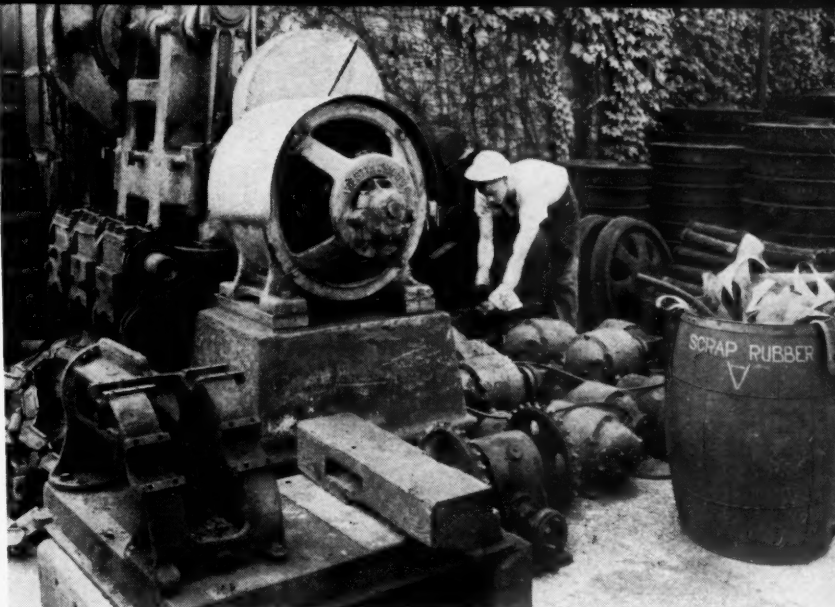
The increase resulting from more intensive scrap-saving efforts is indicated by the scrap sold in the first seven months of 1942:

Iron and steel . . .	3,388,802 lb.
Copper	101,231 lb.
Brass and bronze . .	47,587 lb.
Lead	3,125 lb.
Paper	11,581 lb.
Rubber	10,700 lb.
Manila rope	6,075 lb.

The company, by posters, messages on public address systems and in the



Heavy equipment goes directly to the shop. Here is a 20-ton mine locomotive in the last stage of dismantling prior to a complete rebuilding job.



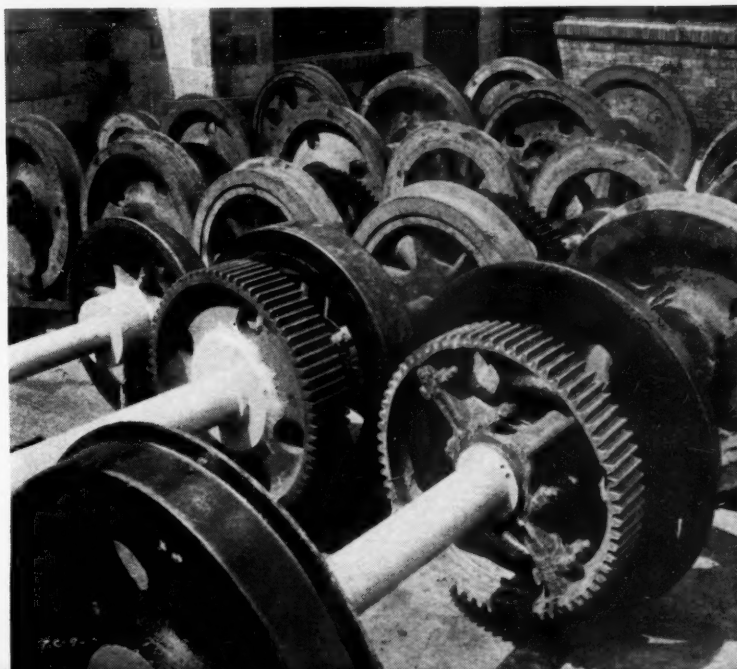
Loading platform at Library general shop, where equipment for salvage undergoes preliminary classification. The large pump at the left will be sold if a buyer can use it; otherwise it will be torn down for scrap.



Worn wheels are built up by welding and then are remachined to factory tolerances. This puts "scrap" directly back to work without burdening hard-pressed metallurgical industries.



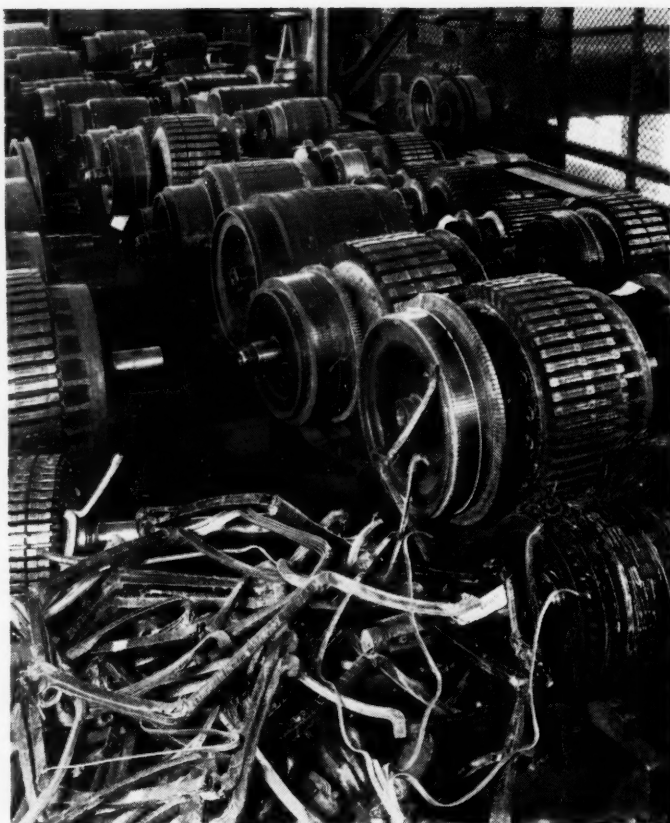
Equipment being dismantled to determine wear prior to deciding whether it should be rebuilt or scrapped.



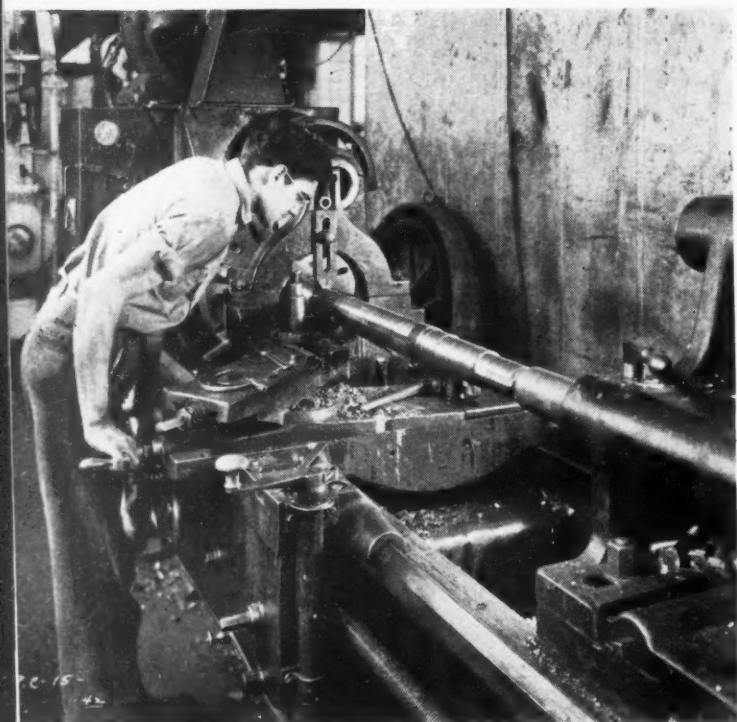
Locomotive gears and wheels in the foreground have been built up by welding and then remachined. Wheels in the background are awaiting the coming "face-lifting" job.



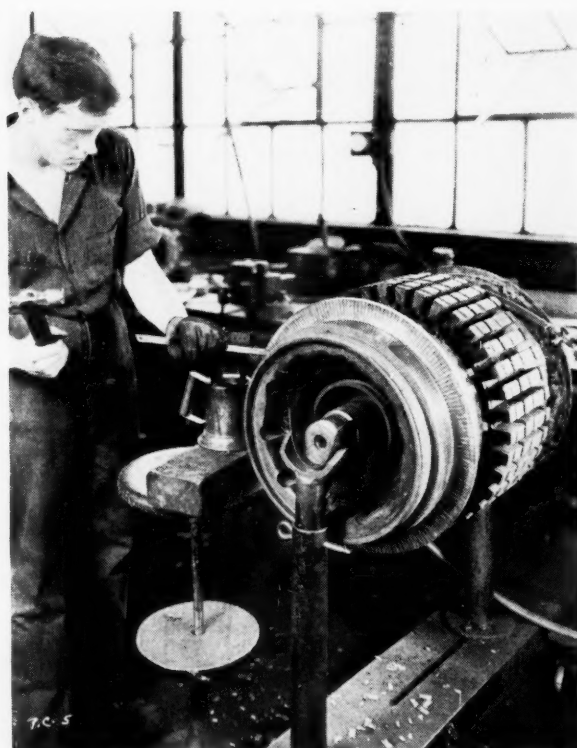
These old locomotive axles will not be remelted for scrap. They will be turned into motor shafts (one shown on pile).



Motor armatures ready for rebuilding. Scrap at left is copper stripped from coils. Right is an armature ruined in service.

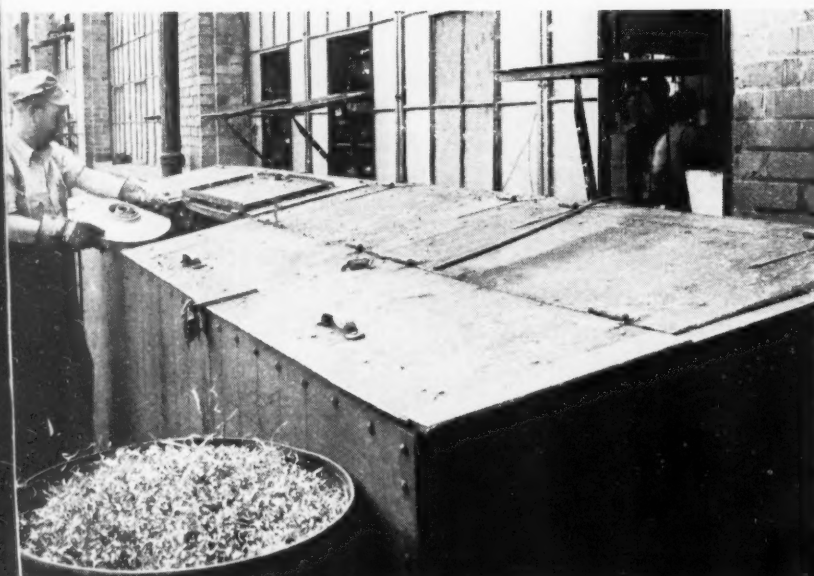


Machinist turning a motor shaft from old locomotive axle.



Each motor is completely stripped and all valuable materials are segregated for salvage.

All turnings and material finally classified as useless are segregated in bins.



Pittsburgh Coal Co. News, and discussions at meetings is endeavoring to bring to every employee the importance of gathering in scrap to win the war. Close cooperation is given the Industrial Salvage Section of the War Production Board, to which monthly reports are made.

While every pound of scrap saved is a vital contribution to our country's needs for raw materials, the organization has been devoting special efforts to the reuse of materials and equipment so that overburdened refining and manufacturing facilities will be completely bypassed. Numerous operations are typical of this work. Worn and broken mine-locomotive axles are sent to the machine shop, where lathes turn them into shafts for motors or generators.

Used locomotive and car wheels, broken gears and parts go to the welding shop, where the worn surfaces are built up by welding. These parts then are sent to the machine shop, where they are remachined to factory tolerances in preparation for further use.

Main Shop for Rebuilding

The Library shop is a completely equipped machine shop designed to build or repair anything used in a coal mine. By handling major repairs it supplements the individual mine shops, where general maintenance work is done. While each mine has its individual scrap reclamation system, the Library shop is the central salvage point. The mine shops are repair points. The Library shop is a rebuilding plant.

A mine locomotive which is beyond the resources of an ordinary mine shop offers a means of following the general salvage system. It comes to the department with its wheels deeply grooved, its axles and bearings worn, its motors and control equipment reduced almost to uselessness. From a utility standpoint it is junk.

The first step consists of taking everything apart. Wheels and gears go to the welding shop and then to the machine shop. Motors and control equipment go to the electrical shop. Axles beyond repair often provide the raw material for new shafts needed on motors. Copper and rubber from the electrical equipment go into scrap. Wherever possible, motors and controls are completely rebuilt. In the course of the whole process, every part is given this consideration: Can we put it back to its original use? Can we make something else out of it? If not, then it is carefully classified as a particular type of scrap.

While the parts are on their way through the shop, the frame of the locomotive is rebuilt. In each step, improvements are made in conformity with the most recent design so that the reassembled locomotive is not just a restoration of the original. It is a rebuilt locomotive embodying all the most recent improvements in design.

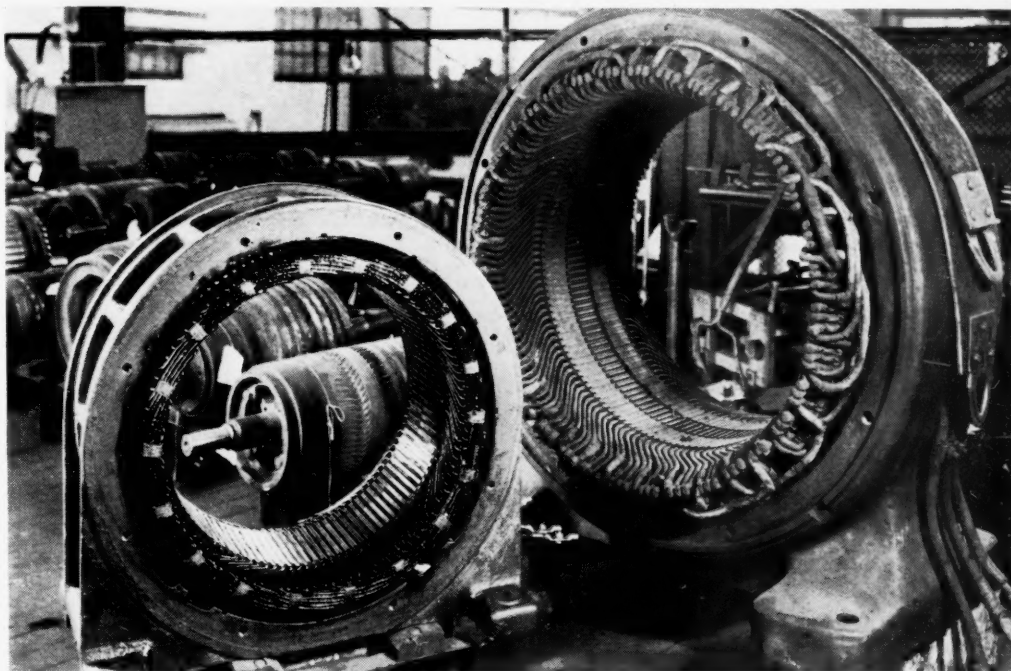
Increasing attention is being paid to the sales of materials and equipment no longer needed in the company's own operations. Recently a power transmission line which had been out of service was dismantled and 70,000 lb. of bare stranded 1/0 and 2/0 copper cable was salvaged. Since our company had no immediate use for such material and it was in such condition that it could be reused, it was sold to organizations doing war work. All such

sales were made with the approval of the copper branch of the War Production Board so that this material would serve the war effort.

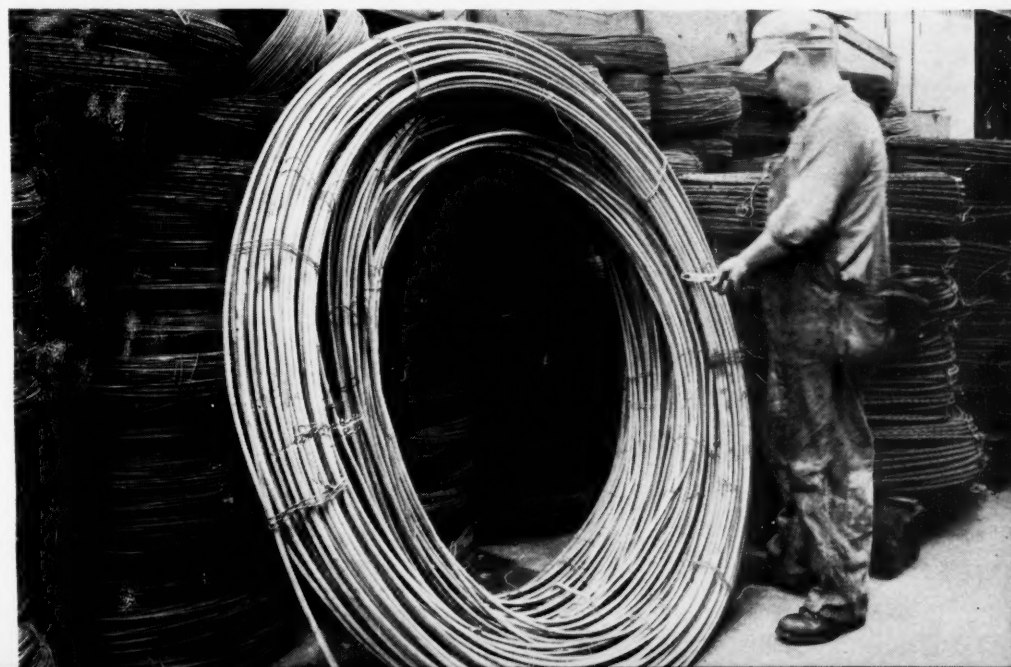
A substantial tonnage of steel angles and channels also was salvaged from the transmission towers. Part of this was sold for second-hand use and part was retained for use in our own operations.

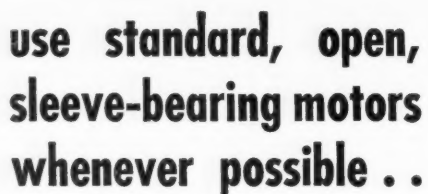
Several years ago the company developed the use of aluminum "H" sections for supporting roofs in mine rooms. Due to the critical need for aluminum, about 16,000 lb. of these beams is being removed from mines and returned to the aluminum industry after replacement with less vital although less convenient supports, even though this represented substantial monetary loss.

A rebuilt motor stator at left with another awaiting rebuilding at right.

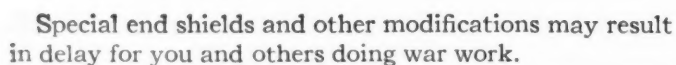


Copper wire reclaimed from idle sections and made ready for further use.

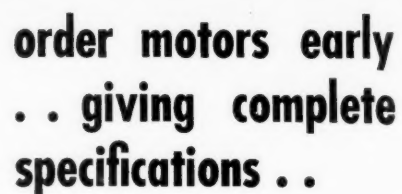


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Sleeve-bearing motors often can be supplied more readily than ball-bearing types because of the present demand for ball bearings on other war equipment. Use ball-bearing motors only on applications where load or mounting conditions definitely require them.

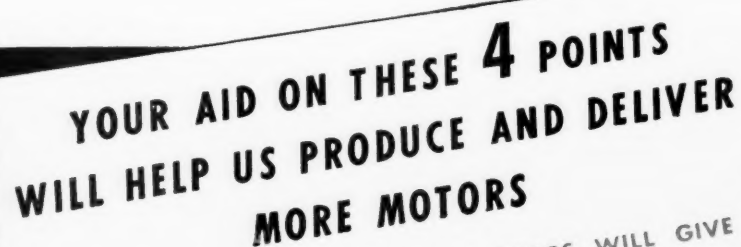


Consider the use of standard or multi-speed a-c motors in place of d-c wherever this alternative is possible.



If you are planning motor drives for conveyors or other equipment for new plants, place orders as soon as design work indicates the motor requirements.

Avoid delay and "mix-ups" by giving complete specifications as shown in table below, preferably on an order form which your G-E motor representative can supply.

[illegible]

WILL NEED MORE MOTORS

YOUR CHOICE OF G-E **TRI/CLAD** MOTORS WILL GIVE YOU
EXTRA PROTECTION AGAINST (1) PHYSICAL DAMAGE, (2) ELEC-
TRICAL BREAKDOWN, (3) OPERATING WEAR.

Tri-Clad motors are available in a full range of sizes from 1 to 100 hp. Your General Electric representative can supply complete information, and help you get the Tri-Clad motor to do your job. General Electric Co., Schenectady, N. Y.

for WAR WORK?

to get them quicker



**give complete
priority information
properly endorsed..**

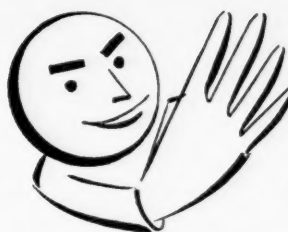
The filling of many motor orders is delayed because of incomplete priority information. If in doubt about details, call your local G-E office.

When placing orders for motors, be sure that complete priority data accompanies *each order* in the form of certificates, endorsements properly signed, etc. The priority is not effective in scheduling shipment until received by your supplier.



Your needs and the war effort are best served by using the proper priority rating as assigned by the War Production Board for the job involved and requesting delivery no earlier than actually required.

Builders of motor-equipped machines for subsequent sale may order their requirements in advance under the Production Requirements Plan.



**check with G. E. for
delivery from local
warehouse stocks..**

To meet urgent war needs, a supply of standard Tri-Clad motors is maintained at G-E factories and local G-E warehouses. Perhaps the motor you want, or can use with a few simple changes, is available for immediate shipment.



Your local G-E motor representative can furnish information on motors which may be in stock in the following cities:

Atlanta, Ga.	Los Angeles, Calif.
Boston, Mass.	Milwaukee, Wis.
Buffalo, N. Y.	Minneapolis, Minn.
Charleston, W. Va.	New York, N. Y.
Chicago, Ill.	Oklahoma City, Okla.
Cincinnati, Ohio	Omaha, Neb.
Cleveland, Ohio	Philadelphia, Pa.
Dallas, Texas	Pittsburgh, Pa.
Davenport, Iowa	Portland, Ore.
Denver, Colo.	St. Louis, Mo.
Detroit, Mich.	Salt Lake City, Utah
Houston, Texas	San Francisco, Calif.
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General Electric and its employees
are proud of the Navy award of
Excellence made to its Erie Works for
the manufacture of naval ordnance.

Specify **TRI-CLAD** *Motors*

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GENERAL  ELECTRIC

730-128-0000

WHY NOT TANDEM SCRAPERS

To Raise Efficiency in Semi-

Two Scrapers in Tandem Suggested for Raising Output From a Single Wall — Double Walls With Tandem Scrapers on Tail Rope for Still Higher Output — Relaying With Two Units an Alternative Method

I HAVE been thinking for some time that it might pay to look at the scraper from a new angle. Personally, I consider that the most has not been made of this efficient and low-cost system of mining. In the system of working as practiced today, the scraper hauls loads of coal one way only — with one scraper only — and on delivering coal returns empty for another load.

Scraper mining, however, need not be limited to one scraper and one wall. Why not have two walls, one on each side of a main central road, and install scrapers on the tail rope as well as on the main, thus securing a steady flow from first one side and then the other?

What is the ordinary output of the 30-hp. scraper, and what could the capacity be? Under good conditions at present, highest output usually is 120 tons per shift — say the output of one wall. But by providing two walls and installing a scraper on the tail rope as well as the main rope, then double the output (240 tons) could be obtained with the same engine in the same time. Furthermore, by using two scrapers on the tail rope and two on the main rope and installing a bottomless bridge over the main road to permit the lead scraper of a pair to pass over to the opposite wall after delivering its load, it should be quite possible to get 400 to 500 tons per shift from a double-wall layout in 3 to 4 ft. of coal. However, with four scrapers, a more powerful engine, say 50 hp., probably would be necessary.

With a system such as this, in conjunction with semi-longwall mining, I think that the scraper can produce as much coal as the most modern loader. In addition, it can work efficiently where heavy grades would handicap the ordinary loading machine. The system can be applied in thick seams as well as thin, thereby providing most of the advantages of true

longwall without a lot of its disadvantages. In a 6-ft. seam, the yield off two 300-ft. walls, two scrapers in tandem on each, might be 800 tons per shift. With a 15-man crew, the output per man-shift would be 53 tons. In 9-ft. coal, with the same crew, the output would be 1,200 tons total, or 80 tons per man-shift, providing scrapers big enough to take away the coal were installed.

It is well-known among longwall men that with the majority of roofs, a major break does not occur until the wall has advanced 100 ft. or more. This fact is utilized to maximum advantage in the intermittent system shown in Fig. 1. In this system, narrow places are cut over to establish the walls, which then are advanced some 60 ft. (75 ft. total including the 15-ft. width of the cutover) and stopped, leaving a 25-ft. pillar against the next cut-over driven to establish a new face. If preferred, the 25-ft. pillar could be abandoned, meaning that the recovery would be 75 per cent. However, if it was proposed to take out pillars at some future date, providing conditions would permit, larger pillars — say 50- to 60 ft. thick — could be left.

High Efficiency Possible

With two walls 300 ft. long and a coal thickness of 6 ft., the output per shift would be approximately 800 tons or, with a 15-man crew, 53 tons per man-shift. If cut depth were 6 ft., ten cuts would be made before it was necessary to move to a new location, thus making the output per move 8,000 tons. In 4-ft. coal, with walls 300 ft. long and cuts 6 ft. deep, assuming the crew size was the same, the production per shift would be approximately 500 tons and the output per man-shift would be 33.3 tons. Production per scraper move would be 5,000 tons.

Scrapers are shown in Fig. 1 as

being served by conveyors, a chain unit, for convenience in shortening it as the walls advance, in turn discharging into a mother belt. It also is possible to serve the walls with track, but in this case it probably would be necessary to crib or otherwise support the roof in back of the walls so that a tail track long enough for a trip could be maintained back of the loading point. With conveying equipment, the same chain unit could be used in advancing the main openings, with the belt conveyor laid up behind as required. The side openings, also accommodating the ropes, also could be driven by hand or conveyor. If by hand, track and mine cars would be used and the track might be left for convenience in delivering supplies to the walls. Special low cars, if necessary, would eliminate brushing in thin coal.

Continuous semi-longwall with tandem scrapers on both ropes is shown in Fig. 2. Where conditions permit, continuous operation, eliminating bothersome and costly moves, theoretically is the best plan. In this case, development is by single openings, using track and hand loading, with blowers and tubing or line brattice for ventilation. However, it is quite feasible to drive two openings in each case, with crosscutting at the desired intervals to simplify the ventilation problem in development. The belt then could be installed after development was completed, with provisions for protecting the tail section when it projects any distance out into the worked-out area. Scrapers A and B could, if desired, be attached to the rope by chains or clamps so that their position could be shifted to shorten the pull when the back ends of the walls were cleaned up.

The crew for the system shown in Fig. 1 (4-ft. coal, 6-ft. undercut and two walls totalling 600 ft. in length, providing 500 tons per shift) might

Longwall Work?

By **ROBERT CARSON**

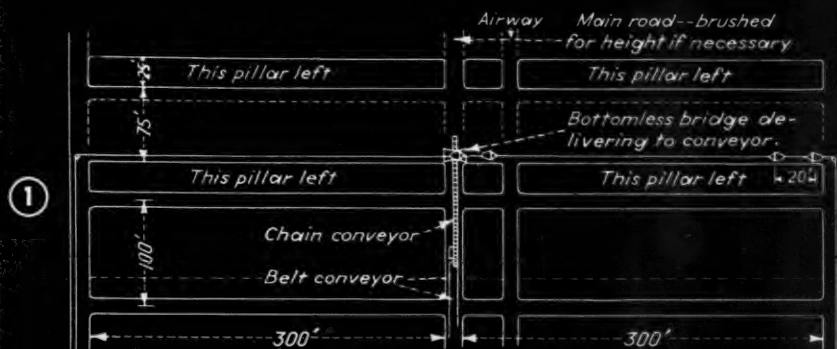
Miner, Delaware Colliery, Hudson Coal Co.
Hudson, Pa.

be as follows: machinemen, 4; scrapermen, 4; timbermen (steel jacks used along the face), 8; drillers and shooters, 3; toppers, 2; hoistmen, 1; total, 22. This would make the output per man per shift approximately 22.7 tons.

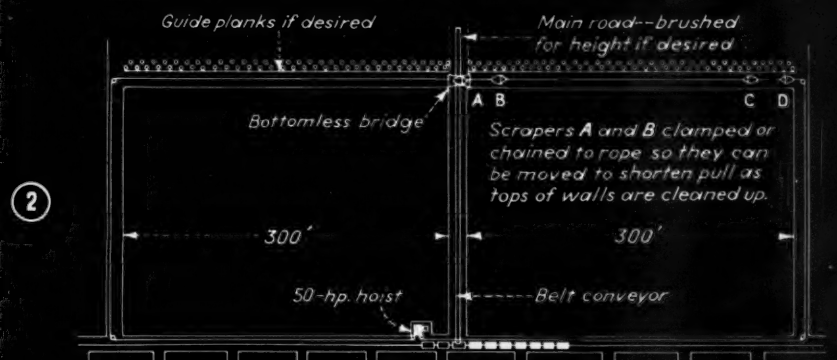
If the grade were heavy, a single wall 300 to 400 ft. long could be established to the rise with a chain pillar 30 ft. or more thick to the dip, as shown in Fig. 3. The chain pillar as noted, would be worked with the wall to provide the necessary space for the lead scraper to pass over the bottomless bridge. Such working could be done by reversing one or both the scrapers. Care should be taken to keep the wall as straight as possible.

Relaying With Two Units

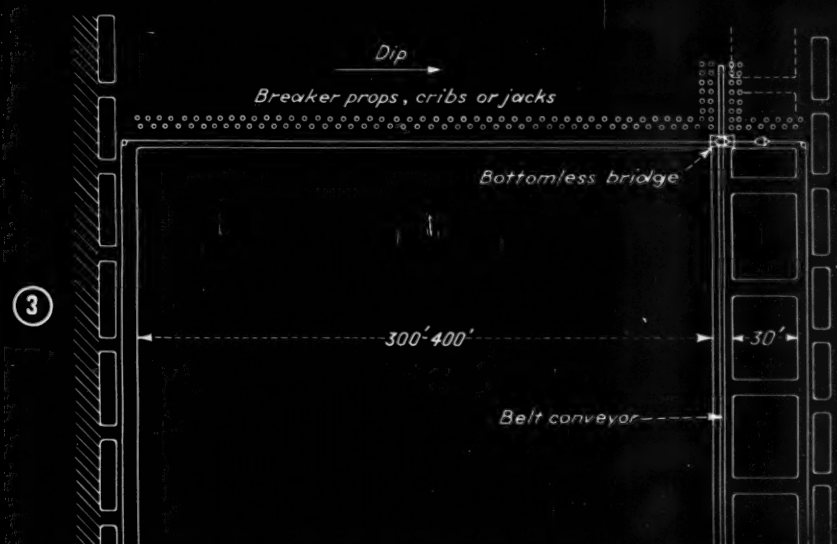
An alternative scraper arrangement, also adaptable to double-wall work, is shown in Fig. 4. In this arrangement, the scrapers are connected to the ropes at intervals equal to half the face length, which makes it unnecessary for the lead scraper to pass over the loading point and also may reduce scraper wear. It will be noted that on each trip the rear scraper pulls coal to a point halfway along the wall, while the front scraper pulls to the loading ramp. On the return, the rear scraper goes to the back of the wall, while the front scraper goes to the point where the coal left by the rear scraper was deposited. Thus, one scraper relays to another. The production therefore is approximately the same, as the scrapers travel only half the distance and two trips can be made in about the same time as one with both scrapers pulled to the bridge. Fig. 4 also shows an alternative hoist and rope arrangement which reduces the length of rope as compared with passing it entirely around the blocks of coal, although it may introduce some difficulties in moving up the tail rope unless it can be kept in front of the jacks, breaker posts or cribs along the face.



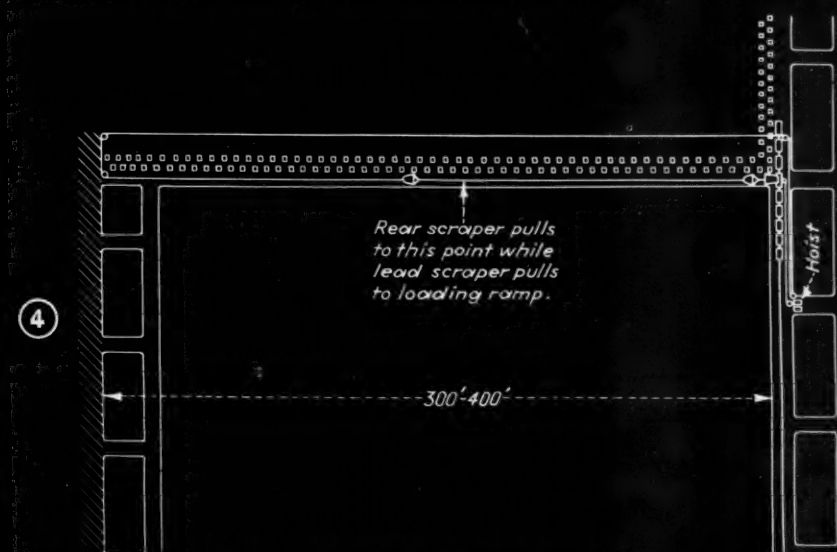
Intermittent semi-longwall with two scrapers in tandem on each wall.



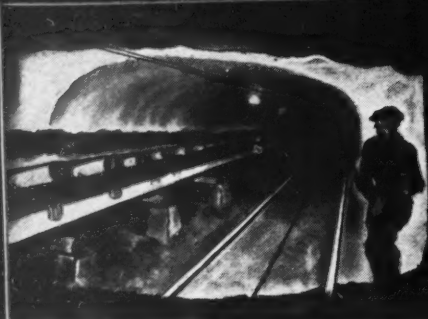
Continuous semi-longwall with two scrapers in tandem on each wall.



Single-wall system with two tandem scrapers and passing space for lead scraper.



Single-wall system with two scrapers at half-wall length arranged to relay coal.



THE FOREMEN'S FORUM

Mine Safety Should Be Taught as a Skill Of Which Workmen Will Become Proud

SAFETY in mining or in any other industry should be inculcated by instruction in safe methods of mining rather than by inspirational talks. Safety should be regarded as a "skill"—as something to be learned by study and experience and the acquiring of which will be regarded as an accomplishment.

At colleges and schools, there is rarely any emotional appeal to the student. He is taught certain facts and principles, and in the course of that education, he becomes, with a few exceptions, thoroughly "sold" on education; so thoroughly indeed that many men decide that education must be the end-all and be-all of their existence.

They want to learn or to teach or to engage in research work for the rest of their years. In fact, most men are so well sold that they want education whether they can use it or not in after life, and, out of sheer love of it, they try to add to it after they leave their alma mater. Education becomes a pursuit rather than a tool.

Similarly, a man trained to use his mind on safety becomes imbued with that study and will not only embrace safe ways of doing things but will regard the safe way as the normal way even if, in any particular instance, it happens that the way advocated as safe involves restrictions which are needless because the hazards they were imposed to safeguard may happen not to be present.

The way thus learned has become a part of the man's skill, a new instinct and a new pride, which he cannot throw off without effort, a part of his mental equipment as the briefcase is part of the person of the lawyer, so that he "is lost" when he does not have it with him. Similarly, a man trained to use the resources of his mind on safety will not only accept prescribed ways of doing things safely but will spread safety and develop new methods of his own.

Safety will become not something urged on him but one of his self-chosen objectives. He will not have to restrain himself from unsafe practices but will regard safety as a positive goal, a pleasurable pursuit. Attitude in life is everything, and if safety is taught as an adventure, an adventure it will become, just as thrilling as jumping off a locomotive to throw a

switch or seeing how high one can stick up one's head in riding under a low roof or doing other daredevil tricks.

These are the reasons for insisting on mechanical, physical and chemical rather than emotional training in safety, even for the men at the mines. It is to be regretted that with most men, even the untrained, the intellectual impulse usually is stronger than the moral and emotional urge and the impressions made by the intellect have the greater permanence. "Pep talks" usually lose their power after a good night's rest. The eloquence is remembered but the counsel forgotten. If the speaker happened to say something that appealed to the intellect, it is not so readily expunged from the memory.

The excellent effect of positive non-moral training for mining men is well illustrated by the first-aid and mine-rescue training work. Here safety work is positive, and engaging in it makes the men so keen for safety that the proverb has been coined that "every first-aid man is a good risk." The statistics prove this to be true.

However, training should be free of cramming. The most essential feature in training is the cultivation of the power to think. Problems, therefore, should be accentuated rather than principles and facts, the latter being the foundation on which the solutions of problems are to be based. Once problems are regarded as the structure of teaching, the students will naturally demand the foundation on which to build; that is, the facts, and therefore the teaching of facts, will become as engaging as the problems they help to solve.

Suicidal the 301st Time

A person violates a safe practice rule in the average case more than 300 times before he is hurt in consequence, and such frequent unsafe acts provide a splendid opportunity for someone to do something about it before the injury finally occurs, say J. W. Randall, vice-president, Travelers Insurance Co. in *Safety*. Most men transgress an immense number of times before the accident gets them. Hazard is patient and stalks its prey a long time, but it ultimately hangs up a head on the wall and it isn't a moose head, but a man's head

that hangs there. "I've done it manys the time before" is the common explicative assertion of the chance-taker, and he is right in most cases. He has done it, but the law of probability will get him in the long run. Some day he will throw dice with hazard and get deuces. Before that time comes, he should be told to quit the game.

When Posts in a Room Break Are Stouter Ones Needed?

Under heavy cover, if the roof sags, it can come down by squeezing the clay from under the props or by breaking or bending them, or by squeezing the cap pieces. Where the cover is heavy, the props cannot support the main roof, and therefore it is not necessary to have them excessively strong as if a great weight had to be sustained. The props are placed solely to hold up the drawslate, not the main roof.

How thick that drawslate may be should be determined, and judgment should be used in that determination, as there may be several layers of drawslate in any one piece of roof and these may fail, one after the other, and they will all need support, so that, in some places, strong posts may be required. In heavy cover, the roof strains are considerable, and the weak slate may be so badly stressed that it will separate from the main roof to a greater height than it will in shallow cover, and therefore stronger posts may be needed in deep workings than in workings nearer the surface. But if the slate is thin and under a massive sandstone roof, there may be little to be sustained, and the props may be of small diameter.

When a post breaks, it usually is a sign that the post has been set too tight for the location in which it is placed. In the center of the room, the post should be less tightly set than near the ribs, as the roof will descend more at that point. No post should be set so as to be under more than a few pounds of vertical stress on setting or, otherwise, after it has been standing awhile, it will be under too much stress—under both the initial stress and the stress resulting from the descent of the roof—and it may take the weight that should fall on other posts.

A prop may fall over on a stiff pitch or it may be blown over by a heavy shot, no matter what the inclination of the floor, or again it may be upset by passing traffic,

but any tightness in excess of what is needed to guard against these eventualities is an excessive pressure and to be avoided in the setting of a prop. Because of these considerations, judgment should be used in determining the size of props and the manner in which they are set.

In Gallup, N. M., in the roadways they erect heavy timbers, which the expansion of the roof breaks. Then, they replace them with lighter and shorter timbers, and these never fail to hold the reduced load, for the roof has expanded as much as it desires.

How the Injector and Atomizer Principle Modifies Gas and Dust Explosions

AT FIRST SIGHT, it would seem that the pressures of an explosion would be communicated in some degree to all parts of the mine in which an explosion occurs, with the severest pressures along the course which the combustion travels; that is, every part of the mine would have a pressure above that of the surface atmosphere. Further consideration would lead, however, to the conclusion that the main blast in passing successive side headings draws air from them much as a blast of steam in an injector* draws steam from the side channels of that device. This suction is aided usually, as in the injector, by the curvature of the ends of the side passages toward the main heading.

These partial vacuums may seem unimportant, but their significance becomes clear when it is remembered that the gases from the explosion can penetrate into areas of low pressure as soon as the air rushes back into the mine after the explosion, and this occurs immediately after the first outrush is completed. In consequence, carbon monoxide may be carried into areas not, as might be thought, by the pressures created by the explosion but, at a slightly later period, in striving to fill the partial vacuum which the explosion creates.

Vacuums Befoul Heading

Moreover, such vacuums permit the atmospheres of abandoned goafs to expand and in part flow out into the headings. Consequently, intakes may receive large quantities of methane, excess nitrogen and carbon dioxide, of which gases or excesses of gases they normally may be free.

In these facts can be found some light on the question whether, after an explosion, to start the fan and whether even to let natural ventilation establish itself. These things some persons may be anxious to do, despite the fact that, if the air is not reversed, such reestablishment of ventilation will drag polluted air past areas on the return side of the explosion area, if there are any, provided the explosion or the men in the mines have not already short circuited them. The restoration of the air current may jeopardize the lives

of the men located in such areas. Even if it should be established that there is no fire in the mine, it still might be dangerous to restore ventilation where live men might be entombed.

However, some may favor the starting of the fan, because fresh air may be needed to dilute throughout the mine the methane and carbon dioxide produced after the explosion and because it will tend to clear out new and old impurities in the headings on the intake side of the explosion, if that cleaning should be necessary. It would not be so badly needed on that side of the explosion if it were not for the injection action, which complicates a situation that otherwise would be reasonably simple.

If the side headings are so well away from the seat of the explosion that the violence has become restricted to the main entry and thus involves no rooms, the quantity of afterdamp may be so small in the airway that, when mixed with the air remaining in the headings and rooms, it will not be in a toxic concentration, especially as outside air in copious volume will enter the mine to fill the vacuous space as soon as the explosion ceases. The cooling that follows a mine explosion produces a rapid inflow of fresh air which may penetrate the mine for a distance of half mile or more, but the inflow of fresh air and afterdamp into the side headings will be less extensive.

Another possibility is that, even in the region of the explosion, as the explosion

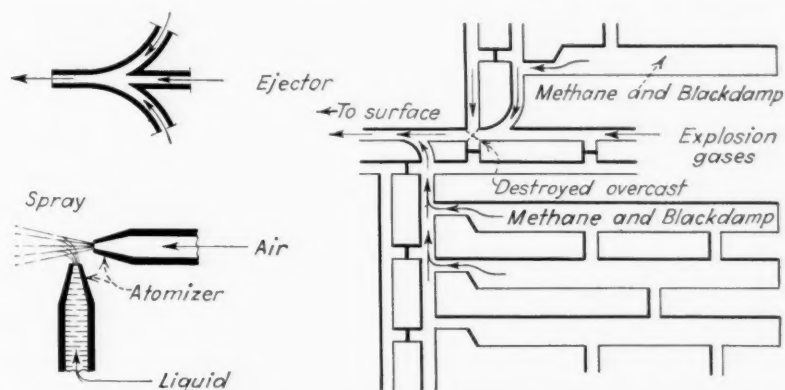
will be most violent and effective in some long straight haulageway or airway, un-baffled by gobs and pillars lying at right angles to the direction of travel, the atmospheres in the rooms will be drawn into such passages, to be followed by a return current under a greater than atmospheric pressure.

The injector principle also may suggest that, instead of stoppings being blown out, they may fall in because of what is termed "suction" at least in those parts of the roadway where the mixture is not so much exploding as traveling. It is said that when big bombs are dropped in an aerial attack, the buildings frequently are demolished more by the return wave than by the direct force of the explosion, and window glass often falls toward the bomb crater, but this would not necessarily mean that the violence of the return wave exceeds that of the explosion but that it is more effective, because the building already may be weakened and the glass fractured by the explosion and because a stress outward is less adequately resisted by the building which already may be weakened.

Focal Point of Blast

However, these facts demonstrate the violence of the return blast, and doubt might be expressed whether some of the deductions that have been made after a mine explosion are justified because too often they are based on the theory that all the violence is away from, and not at all toward, its focal point or line of travel.

It may be recalled that the instruments which registered the effects of a big rock fall in the Bararee colliery, India (*Coal Age*, November, 1941, p. 62), showed that the backlash of the blast gave 1.1 in. of water gage, whereas the outgush produced a water gage of only 0.9 in. A similar difference was noted in the record of another fall, but there is reason to question the validity of that second result, as the recording pen was stopped on one side by the center pin of the instrument and on the other side it passed off the paper.



Because of the tremendous speed at which the explosion gases travel and the lightness of the gas to be drawn out, they suck more methane and blackdamp impurities than would an atomizer or an ejector. They also usually draw them from the nearest and therefore the oldest and foulest workings.

* In the injector the steam is condensed and that action aids in producing the movement of steam from side channels. A closer analogy will be found in the ejector or atomizer operating on air or gas.



STATE-BOARD QUESTIONS

Questions, Second Grade Mine Foremen's Quiz Bituminous Region, Pennsylvania, 1942

Q.—How far may a working place be driven without a crosscut when operating by some other method than the room-and-pillar system?

A.—150 ft. (Art. IX, Sec. 3.) 1 point.

Q.—How much powder may a miner take into the mine on one shift?

A.—Enough for one shift but not more than 5 lb. (Article XVI, Sec. 1.) 1 point.

Q.—When is a workman permitted to travel on haulage roads while going to and from work?

A.—No person shall be allowed to travel on foot to and from his work on any hoisting slope, incline plane, dilly or locomotive road, if other roads have been provided for that purpose. (Article XXV, Sec. 5.) 4 points.

Q.—When a workman is first employed, what special directions must be given him by the mine foreman or his assistant?

A.—Every workman, when first employed, shall have his attention directed by the mine foreman or his assistant to the general and special rules of the mine law. (Art XXV, General Rules, Rule 6.) 6 points.

Q.—How often is a workman required by law to examine his working place during a shift?

A.—Before commencing work, and he shall repeat such examination after any stoppage of work during the shift. (Art. XXV, General Rules, Rule 5.) 4 points.

Q.—Who is permitted to blast coal or rock?

A.—No one, unless the mine foreman is satisfied that the person is qualified by experience to perform the work with ordinary care. (Art. XXV, General Rules, Rule 3.) 5 points.

Q.—If a fan has been stopped during the night, how long must it run before the men can enter the mine?

A.—At least two hours. (Art. IX, Sec. 6.) 3 points.

Q.—A shaft 300 ft. deep is full of water; what is the pressure per square inch on the bottom of the shaft?

A.—130.2 lb. (The weight of 1 in. \times 1 in. \times 1 ft. of water may be taken at 0.434 lb. $300 \times 0.434 = 130.2$ lb. The weight depends on the temperature of the water and on its freedom from dissolved salts and suspended matter.) 5 points.

Q.—When and under what circumstances can the certificate of a certified mine official be withdrawn?

A.—When he neglects his duties or incapacitates himself by drunkenness or is incapacitated by any other cause for the proper performance of his duties. (Art. III, Sec. 7.) 5 points.

Q.—What must the mine foreman do if a workman travels to and from his work except by traveling ways assigned for that purpose?

A.—Report this negligence to the inspector; the law also requires the mine foreman to prosecute the workman. (Art. IV, Sec. 23; Art. XXV, General Rules, Rule 27; Art. XXVI, Sec. 2.) 5 points.

Q.—What must the mine foreman do if an unauthorized person goes into an abandoned portion of the mine or any other place that is not in actual operation?

A.—Report the case to the inspector; the law also requires the mine foreman to prosecute. (Art. IV, Sec. 23; Art. XXV, Rule 27; Art. XXVI, Sec. 2.) 5 points.

Q.—Having an airway 12 ft. wide at the floor, with the bottom $1\frac{1}{2}$ ft. wider than the top and a height of $6\frac{1}{2}$ ft., find its area.

A.—73.125 sq.ft. (Bottom is 12 ft., top $10\frac{1}{2}$ ft.; average, or mean, width is $11\frac{1}{4}$ ft. Area = average width \times height = $73\frac{1}{4}$ sq. ft.) 5 points.

Queries Posed Candidates for First Class Mine Foremen Certificates in Kentucky*

Posting Mine Maps

Q.—How often shall the map of the coal mine be brought up to date?

A.—Twice every 12 months... ()
Once every year... (X)
Once every three months... ()
Once every four months... ()

[Sec. 44 provides that the map shall begin to be made of the mine as of Jan. 1 not later than five days after the first day of January.]

Restraining Inspectorate

Q.—When a mine is closed, as being unsafe, what redress is permitted the owner or operator?

A.—If, in his judgment the mine is safe, he may ignore the order to close... ()
He may continue to operate, provided he employs a new foreman... ()
He may apply to the circuit court for an order directing the mine to be opened... (X)
He may continue to operate, pro-

vided all places have fireboss inspection... ()
[See Sec. 25.]

Machine Bosses' Examinations

Q.—Who should conduct the examination to determine a machine runner's fitness to detect explosive gas?

A.—District mine inspector... ()
Department of Mines... ()
Mine foreman, subject to approval by district inspector... (X)
Superintendent, subject to approval by district inspector... ()

[See Sec. 35, act effective July 13, 1934.]

Firebosses' Equipment

Q.—With what instrument is a fireboss required to examine a mine?

A.—With an electric methane detector... ()
With a flame safety lamp... (X)
By sounding the roof and testing the air velocity... (X)
With an anemometer... ()

[Sec. 36, act effective July 13, 1934, re-

* Continued from May, 1942, *Coal Age*, p. 63.

quires that, in all gassy mines, the fireboss shall use no light other than that inclosed in an approved safety lamp. There appears no reason why he should not use also an electric methane detector to discover the presence and determine the quantity of methane, for he is not required to use the safety lamp to determine the presence of

methane. He is, however, ordered to examine for all dangers. How is not stated. The sounding of the roof is not mentioned, but the necessity for such a test is clear from reference to "all dangers." He is not required to test the air velocity but merely to see that the current is traveling in its proper course.]

Examination for Coal-Mine Officials State of Colorado*

Haulage-Road Accidents

Q.—How would you prevent accidents on haulage roads?

A.—One cannot attempt to answer this question completely. One group of accidents on haulage roads affects men of all occupations who are working or traveling along such roads, but other groups of accidents occur only to certain classes of men. No reference will be made here to the prevention of such accidents as occur mainly to motormen, brakemen, trip-riders and electricians on such roads.

The first group of accidents includes roof falls. These can be prevented by a liberal use of timber, which, where the roads are permanent, should be treated to prevent decay. The undersides of cross timbers should be placed as far as possible at even height, so as not to create a hazard to men traveling on man-trips. Cross timbers preferably may be notched into the rib, unless the coal tends to spall, as is especially true where the coal, being lignitic, eventually loses its inherent moisture and tends to shrink.

With ends sunk in the rib, derailments cannot disturb the timber and let down the roof. Guniting or painting may be used to prevent deterioration of the roof by moisture and oxygen, but some say that guniting may destroy the roof during the short time involved in its application when applied to rocks in sections which harbor no ground water, for then the water in the guniting may find many salts in the rock which have never been subjected to solution or hydration, and which will dissolve or hydrate as soon as an opportunity is presented. In widening old roads or in starting rooms, crosscuts, safety holes or other openings in such a road, special care must be taken, because the drawslate along the edge of the heading may have broken, and then any further excavation will cause a bad fall.

Shelter Holes

Wherever, in Colorado coal mines, says Sec. 3493 of the mining law, manways in mechanical-haulage roads have not been provided, holes for shelter, not less than 50 ft. apart, must be cut into the strata not less than 4 ft. high, 4 ft. deep, 4 ft. wide and level with the road. These must

be kept whitewashed and clear of obstructions. However, in headings from which rooms are driven at regular intervals, not exceeding 50 ft., the mouths of these rooms will serve as shelter holes, provided that, for a distance of 5 ft., the entrance to each room is kept clear of obstructions.

On animal haulageways where manways are not provided and where the clear space between the rail and the side of the heading is less than 3 ft. on the traveling side, shelter holes must be provided, as just stated, except that on room headings the necks of such rooms shall suffice if they are not more than 75 ft. apart and are kept clear of obstructions for 5 ft. All shelter holes shall be kept on one side of the heading, if practicable.

In all headings driven after the passage of the act, clearance shall be provided on the same side of the heading for its entire length, shall be kept clear of obstructions and be 2½ ft. wide as measured from the side of the car if such conditions are practicable in the judgment of the Inspector of Coal Mines and if the condition of the roof will permit (Sec. 3494).

Only officials or repairmen should be permitted to travel slopes, gravity or inclined planes, while cars thereon are in motion (Sec. 3495). Side doors through which men can pass a haulageway door when traveling along such a road are desirable, but far more to be desired are suitable manways for the sole use of men entering or leaving the mine on foot.

Electrical Hazards

Trolley wires used in the operation of locomotives must be guarded where "haulage roads are used as manways or intersect or are crossed by manways." They shall be protected on both sides by guards projecting at least 2 in. below the wire (Sec. 3556). No electric equipment or uninsulated wires shall hereafter be installed in the return aircourse in any coal mine where, because of the presence of explosive gas, such electrical equipment or uninsulated wires would be hazardous (Sec. 3557 as amended by Sec. 12, Ch. 63, S.L., 1929).

Where men get on or off man-trips, they should do it in orderly manner, and preferably under the supervision of their own recognized leaders. They should be forbidden to travel from car to car while the trip is in motion. They should be re-

quired to seat themselves at such a low level in the cars that they will be well protected against collision with projecting roof or timbers, if any.

If possible, they should get on or off where there is no trolley wire, but if they mount or dismount where the trolley wire is present, it should be adequately guarded and the men should enter and leave the trip on the opposite side to that occupied by the trolley wire.

Men on man-trips, says "Tentative Coal Mine Inspection Standards," I.C. 7204, U. S. Bureau of Mines, Sec. 17, Rule 59, should not ride in the car next to a trolley locomotive, should not be permitted to ride on the rear bumper of a man-trip or between cars (Rule 61); man-trips should come to a full stop before men load and unload (Rule 62), and, near junction points, a suitable place with seats should be provided where men may congregate while waiting for man-trips. This place should be so chosen that the lives of the men will not be jeopardized should a car or trip run away or be wrecked (Rule 63). No material except tools and other supplies that can fit inside a separate car should be hauled on man-trips, and no explosives should be carried thereon (Rule 64).

More drastic than the rule already given regulating the protection of men from electric shock on mounting or leaving man-trips is Rule 66, which reads: "At man-trip loading and unloading stations, power shall be cut off the trolley wire while men are loading or unloading; also, the wire should be well guarded at those stations." These, of course, are not laws but "inspection standards."

Clear the Roads

Roads should be kept free of excess spillage, fallen rock and other debris, and the clearance space should be level and unobstructed. Frogs, guard rails and lead rails should be well blocked; that is, provided with wood or other blocks so placed and affixed that men traveling along the road are not likely to wedge their shoes in the angles formed by these rails. Shelter holes, says I.C. 7204, Sec. 17, Rule 33, should be provided on both sides of all doors. Ditches that cross the track, it may be added, should be boxed, or covered pipes should be used to convey the water across the track.

Most important it is that some one competent person with a good light, a sounding rod and a scaling bar should inspect the roof of the haulage road every day and make provision for prompt repairs. It would be well for him to make the trip first looking at the roof and then reverse his steps, examining the track, rail bonds and ditches, reversing the direction of vision every day, one day looking outby at the roof or floor, and the next day looking inby at same.

When men carry hand-drills in haulageways, they should not carry them on their shoulders but in their hands, for the drill may touch the trolley wire and thus cause an electrocution or a shock.

* Continued from August, 1942, *Coal Age*, p. 71.



Tippie at the Wyoming mine of the Red Jacket Coal Corp.

Timken Bearing Equipped mine cars built by American Car & Foundry Company in service at the Wyoming, W. Va., mine of the Red Jacket Coal Corp.



To hasten
Victory and assure
profitable operation after-
wards, put all of your
mine cars on Timken
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TAPERED ROLLER BEARINGS

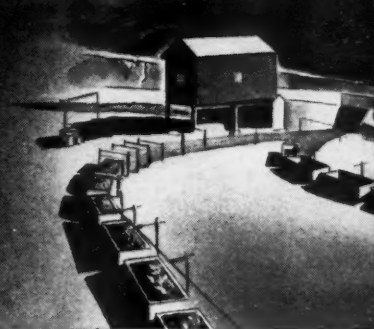
Manufacturers of Timken Tapered Roller Bearings for automobiles, motor trucks, railroad cars and locomotives and all kinds of industrial machinery; Timken Alloy Steels and Carbon and Alloy Seamless Tubing; and Timken Rock Bits.

Don't permit transportation to be a bottleneck in your mine. Longer, faster moving trips are the rule when cars roll on Timken Tapered Roller Bearings. Furthermore, lubrication is simplified; lubrication periods greatly extended; radial, thrust and combined loads carried with a wide margin of safety; wheel breakage reduced; consequently fewer cars laid up for repairs.

The Red Jacket Coal Corporation which operates a number of mines in West Virginia has approximately 1,700 Timken Bearing Equipped mine cars in service and is most enthusiastic about their performance. In fact this company definitely has standardized on Timken Bearings for all of its mine cars. It will pay you to do the same.

THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO

TIMELY OPERATING IDEAS



Changing Batteries Facilitated By Special Charging Racks

Special racks fabricated of light rails and rods facilitate changing locomotive batteries at the Castle Gate No. 2 mine of the Utah Fuel Co., Castle Gate, Utah. The racks are designed so that cranes or other lifting means are unnecessary, the power for moving batteries being provided by the locomotive itself. Also, they naturally are sectionalized and demountable so that they may be moved easily when desired.

Two racks are set up in a charging station, one for exhausted and the other for fresh batteries. The battery cases are provided with wheels on each corner and with lugs for a locking bar. Similar lugs on the locomotive complete the facilities for shifting the batteries on the racks and for holding them in place on the locomotive chassis. While moving from one rack to another the locomotive is powered through a cable and plug, shown lying on the floor in one of the accompanying illustrations.

The changing operation is substantially as follows. When the locomotive comes into the station it runs into the rack for exhausted batteries. The wheels on the battery case engage the sloping rails on the rack and the case is lifted off the chassis. The locomotive continues to move forward, shoving the battery on back to the far end of the rack or against any other battery that may be on charge. This is made possible by the locking bar pre-



This close-up shows the details of rack construction, use of wheels on the battery cases and (arrow) the lugs for the locking bar, which is dropped vertically down into similar lugs on the locomotive.

viously mentioned, the lower end staying in the lugs on the chassis and the upper in the lugs on the battery case, which slides up the bar. This bar provides the necessary rigid connection required for pushing the battery. When the battery has been spotted, the bar is pulled up

out of the lugs and the locomotive backs out and switches over to the rack containing the charged batteries.

In taking on a charged battery, the locomotive runs up under it so that the holes in the lugs on both the battery and chassis are in line. Then the locking bar is dropped through the holes in the lugs, connecting battery and chassis together. The locomotive then backs off, the battery riding down the inclined rails to its resting place on the chassis. The cable is disconnected and the battery connected in, whereupon the locomotive is ready for another tour of duty.

Bumping Unit Screens Stoker At Ohio Truck Mine

At the 100-ton-per-day truck mine of the Orchard Coal Co., near Cambridge, Ohio, the owners, M. K. Petty and C. A. Rome, saw an opportunity to make and sell stoker coal if they could add the necessary equipment at small expense. Two powered units were required—an elevator and a fine-coal screen. A bucket belt elevator with motor drive was available but there remained the problem of a power screen. This was solved by building a "vibrating screen" operated by a crank



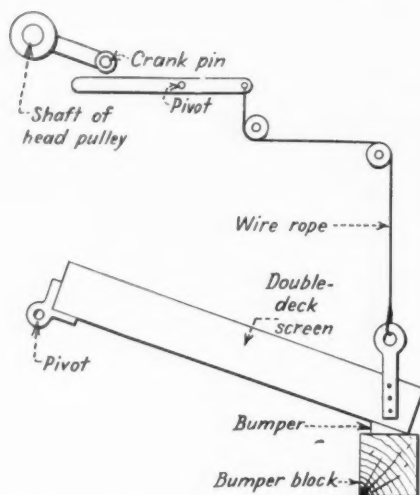
Not a shaking nor a vibrating screen but instead a bumping screen.

and pin added to the shaft of the belt-conveyor head pulley.

Instead of rapid vibration the screen operates by a slow bumping of the lower end, which is raised a few inches and dropped against a wooden bumper. The mechanism consists of a wire rope, two sheaves and a lever. On each revolution of the head pulley the crankpin forces the end of the lever down and then



Two racks make up the charging and changing facilities. Batteries are being charged on the rack at the right. In the foreground is the cable used during battery changing.



Each revolution a crank on the end of the elevator head shaft depresses the lever.

slides off, thus releasing it and dropping the lower end of the screen, which had been lifted through action of the lever and wire rope. For the small quantity of stoker coal made (the mine has no crusher), this screen, according to the owners, gives satisfactory results.

The mine operates on purchased power and has a motor-generator set supplying 275 volts d.c. to a small trolley locomotive and breast machine. Alternating-current motors are used on the following: the drum hoist which pulls mine cars up an incline to the tippie dump; shaker screen, the bucket belt elevator and bumping screen and a mine fan.

Work Bench Out From Wall Provides Accessibility

In mine repair shops it is often necessary or desirable that two men work at the same time on a motor, drill or other item of equipment which is placed on a work bench for convenience. If the bench is against the wall, as in a majority of mine shops, then the two men get in each

other's way and cannot work to the best advantage. Even though but one man is working he is at a disadvantage if the item is heavy and he must swing it around to get at the other end.

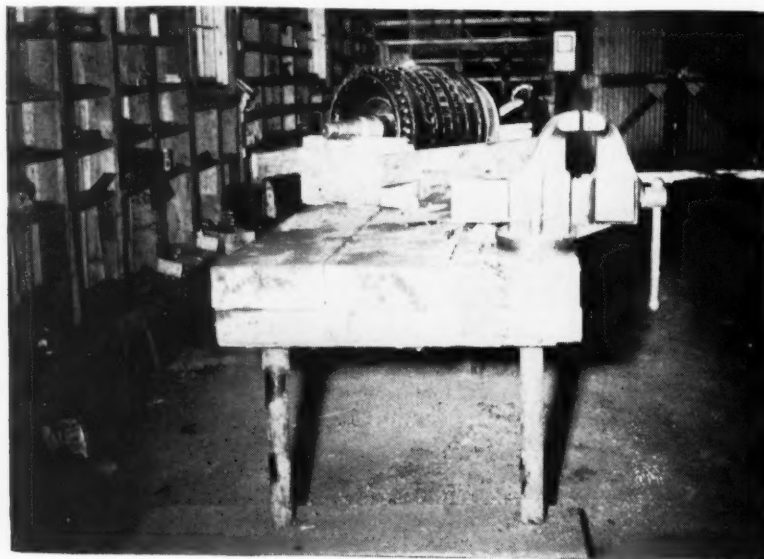
Those difficulties of the wall bench were taken into consideration and rectified when the pit-mouth shop was built at the new mine of the Utilities Elkhorn Coal Co. (page 43 of this issue), Esco, Ky. Benches 3 ft. wide were spaced 4 ft. from the wall; thus two men stationed on opposite sides of the bench can work simultaneously on the two ends of a motor. If but one man is on the job, he steps to the other side of the bench instead of having to turn the item 180 deg.

The benches (see illustration) are of wood supported by steel legs set in concrete. The top is 4x12-in. oak planks and the legs are 2-in. pipes. Along each side of the shop is a bench 4x20 ft. Dimensions of the building are 30x60 ft. and most of the side-wall space is utilized as storage for small items by placing shelf boards between studdings. As compared to a wall bench, the floor bench promotes neatness by discouraging chucking waste or reserve materials in the dark corner under the bench next to the wall.

When asked "Whose idea was this bench arrangement?" Charles Calhoun, chief electrician for the mine, replied: "Oh, all of us."

Slot Welding Avoided Warp When Building Conveyor

In the construction of a new preparation plant at Esco, Ky., prevention of warping when arcwelding a division strip to the bottom plate of a flight conveyor was successfully accomplished in an original way by O. J. Williams, electrical and mechanical engineer of the Utilities Elkhorn Coal Co. The unit is a mixing conveyor, single-compartment top strand and double-compartment bottom, with flights 36 in. wide by 16 in. high. Length of the conveyor (centers distance) is 91 ft., of which 41 ft. is on a rise of 13 deg. and the remainder level.



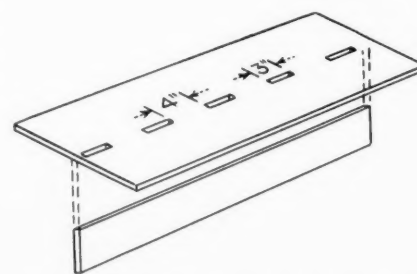
Showing bench construction and spacing from wall.

Difference

What constitutes the difference between efficiency and inefficiency, between low and high cost? Usually, other conditions being equal, the difference lies in the knowledge and ability of the men who operate the plant. With knowledge comes ability. This department is operated to increase the knowledge of operating, electrical, mechanical and safety men, and their contributions are urgently solicited to make it as timely and useful as possible. If you have a kink, here is the place for it. Send it in, with a sketch or photo if it will help to make it clearer. For each acceptable idea, Coal Age pays \$5 or more on publication.

The accompanying illustration shows the top and bottom runs of this conveyor. Pan bottoms, sides, the partition strip and flights are all made of 1/4-in. plate. Sides as well as the strip are arcwelded to the bottom. The sketch indicates the method of preparation for welding the partition.

A special work bench of wood with its top in two parts—that is with a continuous slot along the center line—was built to accommodate the job. The first step was to lay the bottom plate, properly centered, on the bench, then to cut with an acetylene torch a series of holes or slots along the center line of this bottom plate. Slots were cut 5/16 in. wide by 3 in. long on 7-in. centers, or 4 in. apart. The partition plate, or strip, was then inserted between the bench top halves and brought up plumb against the center line of the



Welding is done through and in the slots after the strip is brought up (broken lines) with the center line of its upper edge coinciding with the center line of the slots.

plate, coinciding with the center line of the slots.

Welding was done with the electrode reaching down into the slot and touching the partition-plate edge. Filling these slots completed the job of attaching the strip along the center line. As a precaution against undue local heating, the welding was staggered from one slot to another (about 7 slots apart). Neither the partition nor bottom plate was warped.

Sides were arcwelded by the usual method after tacking at close intervals. This Esco conveyor is the second built by

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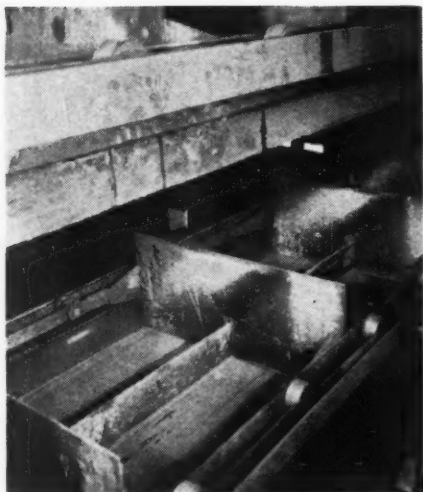


MAKING BATTERIES LAST HELPS STOP THE AXIS!

- 1 Keep adding approved water at regular intervals. Most local water is safe. Ask us if yours is safe.
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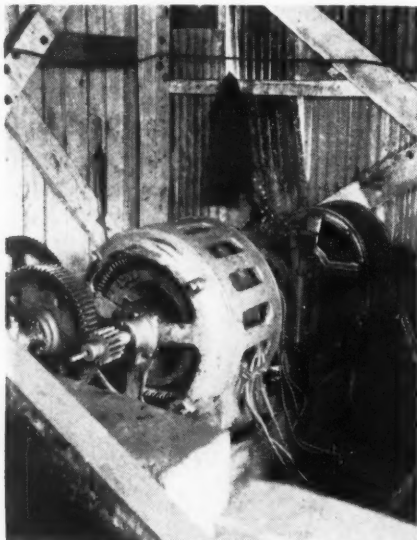
Top and bottom strands of the welded conveyor.

Mr. Williams by arcwelding. The first, in use at Martin No. 10, showed, according to Mr. Williams, a large saving and thus dictated a similar construction for the one at Esco.

Retarding Conveyor Control Generates A.C. and D.C.

Both regenerative and dynamic electric braking are used simultaneously for retarding a rope and button conveyor at the new mine of the Utilities Elkhorn Coal Co., Esco, Ky. This arrangement, shown in the accompanying illustration, is the idea of O. J. Williams, electrical and mechanical engineer.

Conveyor length (centers distance) is 906 ft. The average pitch is 31 deg. and the rated maximum capacity is 350 tons per hour. The a.c. drive and brake, which is a motor performing the duties of both motor and generator, thus recently termed a "mogentor," is an Allis-Chalmers motor rated at 40 hp., 440 volts, 860 r.p.m. Its shaft is mechanically connected by flexible couplings to a magnetic band brake and to



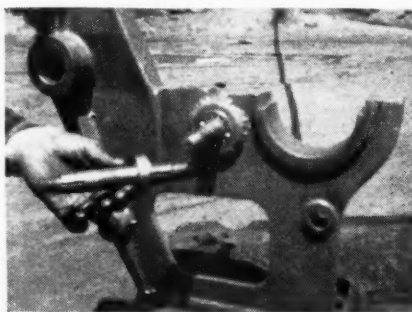
Control and braking by a.c. and d.c. unit plus a magnet.

a General Electric 20-hp. 230-volt 800-r.p.m. compound motor with its series fields reversed for generator duty and its terminals connected to the resistor of a portable arcweld bonding machine which serves to dissipate the energy in the form of heat.

This d.c. unit is adjusted so that it normally does most of the braking. Thus, the conveyor speed does not go much above the synchronous speed of the induction mogentor. If a failure of the d.c. unit should occur, then the a.c. takes over after allowing some increase in speed. With the extra d.c. unit, power failures on the a.c. line are of no consequence. The magnetic brake would then normally stop the conveyor, but even if it failed the d.c. generator would keep the speed within safe limits. It is planned that an automatic mechanical brake, now partially installed, will be completed when time permits. The proposal is to use a flyball governor to start a motor-driven oil pump that will actuate the brake by means of a hydraulic cylinder.

Ball for Sleeve Bearing Lengthens Life on Reel

Replacement of sleeve with ball bearings on Westinghouse YR-2 reels to lengthen bearing life is shown in the accompanying illustration submitted by R. E. Small, electrician, Laurel Smokeless Coal Co., Kathryn, W. Va. "Three to four months," writes Mr. Small, "was all the wear we could get with the old sleeve bearing, with increased wear on gears and pinions. I built up the bearing

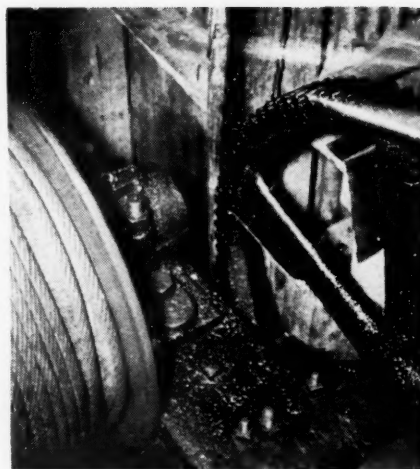


Showing how ball bearings are substituted for sleeve in reel.

losses with bronze-weld rod and bored them out to take a 205 bearing on each side. The shaft fits were made from one end as shown. I have six in service now, one for over a year, with no wear and gears as good as new."

Tin Paddles on the Hoist Gear Put Air in the Pants

Summer heat on muggy days in a small flat-roof building is bad enough without the added heat from operation of an electric motor and control. To make less irksome the job of operating the slope hoist housed in that type of building at the truck mine of the Orchard Coal Co., near Cambridge, Ohio, the owners, M. K.



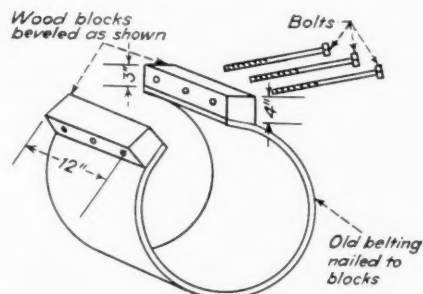
Paddles wired on proved good for permanent duty.

Petty and C. A. Rome, put tin paddles on the large spur gear of the intermediate shaft.

This simple expedient stirs the air around the operator's pants legs and induces some circulation of outside air through the door and window of the shed. The tin paddles were cut from 5-gal. oil cans and, as indicated by the illustration, are fastened to the gear spokes by the baling-wire, or Model T, repair method, which seems to hold the paddles in place O.K.

Clamp for Stopping Pipe Leaks Made From Old Belting

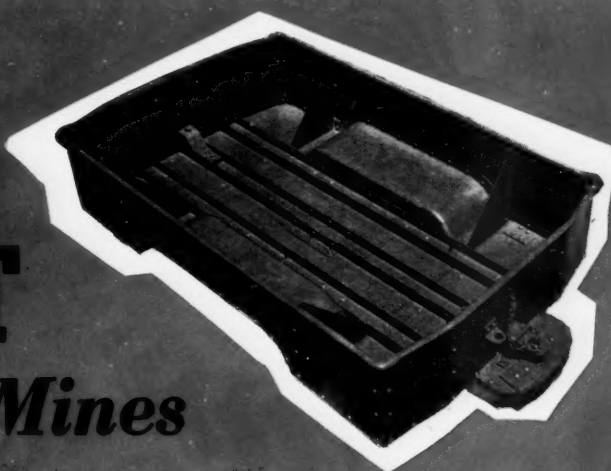
For use in stopping low-pressure leaks in mine pipelines which have holes eaten in them by acid water, Charles H. Watkins, Kingston, Pa., suggests the clamp shown in the accompanying illustration. Blocks of wood of the shape indicated are nailed to strips of old belting. By placing the belt around the leak and tightening the bolts, the belt is drawn tight to stop the leak. If desired, extra packing or filling strips may be placed under the clamp, which then is applied and tightened as usual. The clamp also may be used, says Mr. Watkins, on suction lines.



Details of pipe clamp using old belting.

Emphasizing also that the clamp is for emergency use, Mr. Watkins likewise points out that it is not intended to replace the similar iron or steel clamp often used for high-pressure work. For low-pressure work, also, it is possible to use light waste sheet iron, thus saving heavier sheets for other use.

To get
WAR OUTPUT
from Mechanized Mines



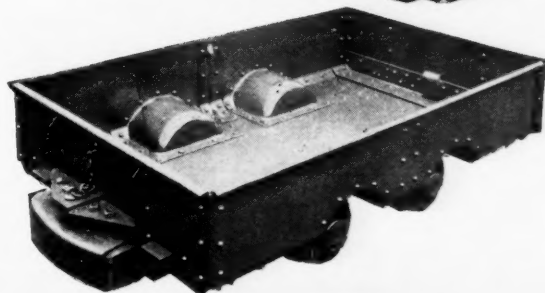
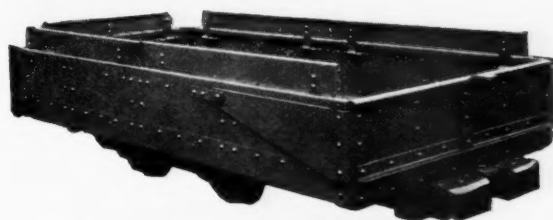
Discard obsolete types of mine cars—cars built originally for hand loading and that have passed their day.

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-conserve rubber for Victory!

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Seiberling tire *expel dangerous internal heat*—the same heat that causes more tire failures than all other factors combined. Today, this extra protection is more important than ever, for *all* wartime truck tires contain less crude rubber and more reclaim—are far *less resistant to internal heat*.

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Your trucks are vital units of transportation in America's war effort. To "keep 'em rolling" for the duration, care for your tires *now*. Here are four steps you can take to make those tires wear longer . . .

1. Drive under 40 miles an hour; speed burns up rubber.
2. Drive only when necessary; conserve vehicle and tires.
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4. Check tires for proper inflation at least once a week. Have a reliable service man check wheel alignment, brakes, and tire casings regularly. Seiberling Distributors offer this mileage-doubling Protectire Service.

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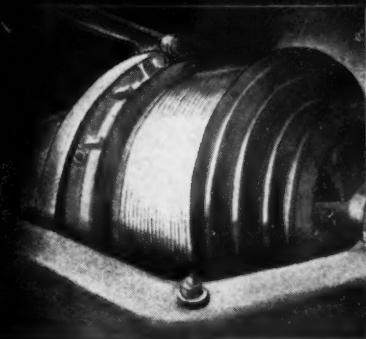


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TIPS FROM MANUFACTURERS



Velocity-Stage Turbines

Velocity-stage turbines designed to meet modern conditions of steam pressure and temperature are offered by the De Laval Steam Turbine Co., Trenton, N. J. Where used for driving auxiliaries, such as pumps and fans, they can in most plants be connected directly to the superheated steam main. The efficiency is said to be as high as is attainable with a single pressure-stage, and where the exhaust steam is utilized for heating and process purposes high over-all economy is had.

The turbine has a centrifugal speed governor and an independent emergency tripping device consisting of an eccentrically loaded, pivoted ring which, at a predetermined speed, releases the independent emergency shut-off valve, which has a stainless-steel stem. The valve can also be tripped and reset by hand.

The parts for these turbines are manufactured in quantities, using special jigs, gages and fixtures, and are inspected by means of limit gages to insure interchangeability and to eliminate hand-fitting. Each part is marked with symbols to certify inspection and for identification when ordering a duplicate part. After assembly a running test is made of each unit to insure satisfactory mechanical operation.

Anode Circuit Breaker

Protection of mercury-arc rectifiers against backfires is now assured through the development of a new circuit breaker (Type DB-2), the I-T-E Circuit Breaker Co., Philadelphia, Pa., announces, at the same time stating that for the time being the new breaker will be limited to special war-production installations.

"The most persistent and troublesome faults occurring in the operation of mercury-arc rectifiers are known as backfires,"

I-T-E points out. "Theoretically, backfires cannot occur, but occasionally, for some unknown reason, a cathode spot may form on one of the rectifier anodes. When this happens, the machine ceases to rectify and a short circuit results on both the a.c. and d.c. systems."

The DB-2 breaker, of the high-speed anode type, is designed to halt the rise of the backfire current in less than 1/240 second, clearing backfire currents from other rectifiers in parallel and simultaneously interrupting the backfire current supplied by other anodes of the same rectifier. A semi-high-speed cathode breaker is used for back-up protection and to provide through gang tripping, a means of dropping a large unit of load fed from a group of rectifiers. "Backfires are not the only faults which can occur in a.c.-d.c. rectifying applications and other protection equipment also is quite necessary."

Loose-Pulley Oiler

For use on loose pulleys, idler pulleys, clutches, eccentrics, and similar rotating machine parts, a new wick-type lubricator is offered by the Oil-Rite Corporation, Milwaukee, Wis. It is designed to deliver a constant, positive and regulated quantity of filtered oil to shaft or bearing while pulley is in operation, and to prevent oil waste when pulley is idle. The reserve supply of oil is always visible.

This new lubricator consists of a simple glass oil reservoir mounted on a hollow metal stem. As the pulley rotates, and the lubricator with it, centrifugal force throws the oil against the top of the reservoir and into the two ports in the stem. These admit oil to the wick, which filters out dirt and sediment, and conducts the oil directly to the face of the shaft.

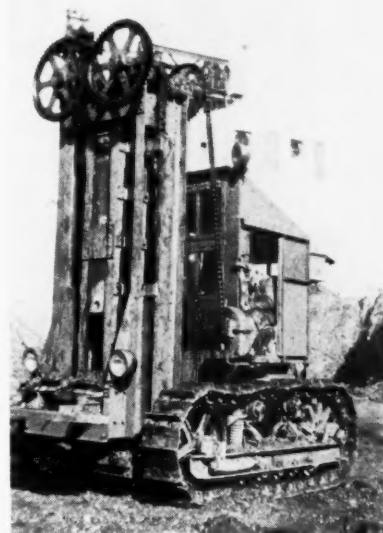
The quantity of oil to be delivered is regulated by a small plug which controls

the area of the oil ports. Reservoir is filled from the top, quickly and easily. Five standard sizes are available—capacities from 1/4 to 2 1/2 oz.—for standard tappings from 1/8 to 1/4 in.

Pinning Machines

United Iron Works Co., Pittsburg, Kan., is manufacturing pinning machines for use in strip mining in Kansas, Oklahoma and Missouri where the coal is up to 30 in. thick.

The machine pictured, built for the Commercial Fuel Co., is equipped with a



double chain powered with industrial unit power plant made by Allis-Chalmers and the machine is mounted on the chassis of a Caterpillar 60 tractor. The weight used on this machine is about 5,000 lb. and the single pin is 4 in. in diameter where it fits into the weight. The individual power unit is mounted on the side so that it does not obstruct the vision of the operator. The machine backs away from the work and the one power unit propels the machine as well as operates the weight.

Three-Part Pulverizer Hammer

The Clark renewable-tip pulverizer hammer (patent applied for), announced by the American Manganese Steel Division, American Brake Shoe & Foundry Co., Chicago Heights, Ill., features metal conservation in its design. It consists of a weighted manganese steel head connected to the





Your men can start holes and drill them more quickly and easily. Among the important benefits you will find are—the breaking action works faster—you eliminate coring—there is less vibration—you don't experience costly auger bit breakage—power costs you less—auger wear is minimized—you ease the burden on the men who run your drills—you drill straight holes without choking and thoroughly clean them without scraping.

COALMASTER is made in sizes to drill correct holes for all powder, CARDOX, AIRDOX, Hydraulic and special requirements.

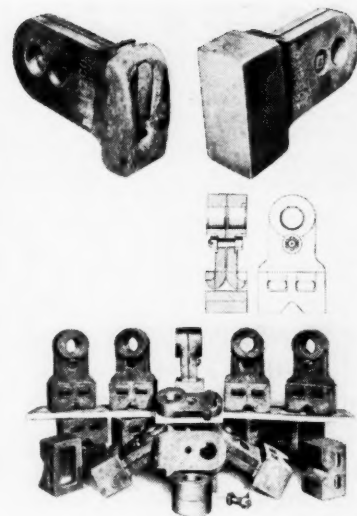
These are the results of buying your tools in a Matched Set, as recommended by a drilling specialist. With COALMASTER, the Head, the Bit and the Auger are a Matched Set designed to give you these advantages.



CENTRAL MINE EQUIPMENT CO.

ST. LOUIS, MO.

"The Drill Bit People"



rotor by two matching arms or bars of manganese steel. On the lower end of each bar are hooks which engage internal pockets in the head. The bars are bolted together under the eye so that they form a one-piece arm; yet they are easily disengaged from the service worn head by unbolting.

Six distinct advantages are claimed for the design: saving in weight of discarded parts; two-thirds of hammer head can be used up before renewing is necessary; time consumed in removing old and replacing new head is negligible; no operating stress is imposed on shank bolt used for assembling; head cannot work loose and come off arm as long as the latter is on the supporting rotor pin; and no metal is lost by too early discarding of heads, as the maximum use is indicated when lower ends of arms are visible.

Drafting Aid

A guide for draftsmen, artists, layout men, etc., known as the "Reduct-o-graph," is being distributed by the Industrial Art & Drafting Co., New York City. Printed in two colors on substantial stock measuring 16x22 in., it is designed to help plan line drawings scientifically for clear reproduction in positive or negative, in original or reduced sizes. These commonly used elements and types of work are reproduced in positive and negative, in original and reduced sizes: lines, dot Benday, cross-hatch, type graphs, craftint, pen work, lettering, diagrams, cross sections, and 65-screen Velox print.

Lengthening Bearing Life

Ahlberg Bearing Co., Chicago, has developed an adaptation of a production-type bearing washer for industrial plant use so that bearings can be washed and thoroughly dried for periodical inspection and then repacked with fresh lubricant, thus reducing the need for replacements. The unit is easily portable and has a sealed compartment to prevent evaporation loss of the solvent solution. Provision is made for a compressed-air dryer which blows the bear-

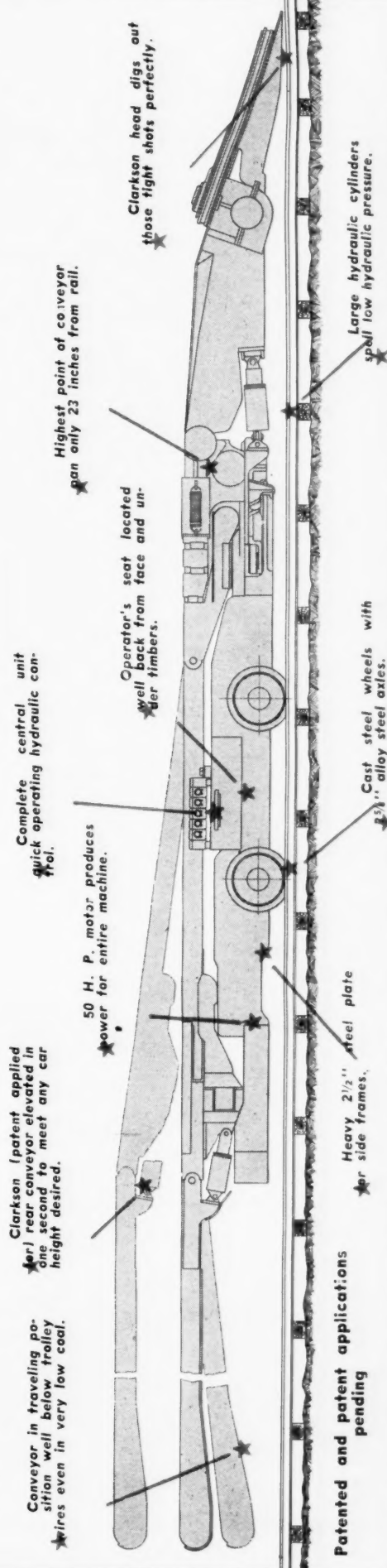
CLARKSON UNIVERSAL 24-BB

"COAL DIGGER" WORKING ON 14% GRADES IN THE HILLS OF WEST VIRGINIA

Grades like this particular one are not too tough for the CLARKSON to tackle and successfully work. This "lowest track loader on wheels," known as a real digger for high and low coal, is working under a variety of conditions in numerous mines and proving day after day that it produces more tonnage . . . faster. The CLARKSON is fully able and gives more satisfactory results in room and heading work—room clean up—pillar and rib extraction—all development work—and in loading coal, slate, rock.

Let us tell you what users say—also get descriptive folder that gives full details and tells about the CLARKSON Loading Head—the solution for set-down shots.

Made for 38 inch coal and over—this loader will help you move coal with greatest speed. Coal users are placing orders now so as to relieve the nation's transportation of general haulage for greatest cooperation in armament program. The CLARKSON will give you that increased production so essential today. Low maintenance, flexibility, ruggedness—plus quick vertical or horizontal adjustment.



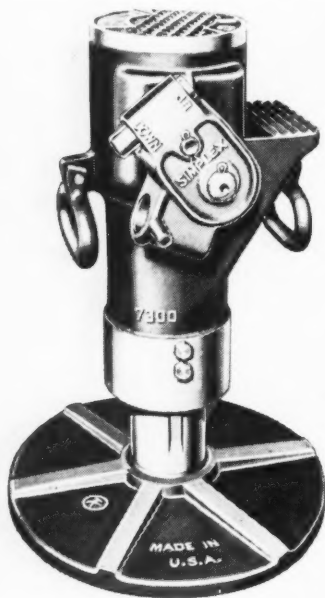
CLARKSON MANUFACTURING COMPANY NASHVILLE
ILLINOIS

ing dry and clean, making the whole operation complete and easy in a minimum of time. The unit weighs 10 lb. and handles a full range of bearing sizes.

An additional unit for repacking the cleaned bearing with fresh grease is a second development. With 5 lb. of clean lubricant in its base the bearing is simply placed on top of the unit and a lever forces the clean grease completely through the bearing without waste or muss and without danger of dirt and contamination being carried in the lubricant.

Screw Jack

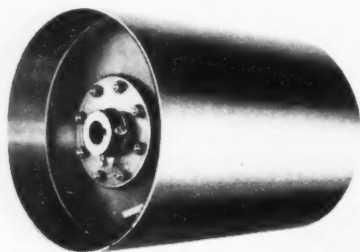
Templeton, Kenly & Co., Chicago, announces addition of a 25-ton standard-speed bevel-gear ball-bearing screw jack, No. 7300. Designed for heavy-duty lifting, lowering and skidding work, the manufacturer states that the safe mechanical action,



screw adjustment and inclosed ratchet mechanism combined with both toe and cap lift fit it for heavy industrial work. It is guaranteed to lift its full rated capacity of 25 tons on cap and 12½ tons on toe; has a full 6-in. lift and weighs 82 lb. complete.

Tight-End Conveyor Pulleys

The American solid conveyor pulley is a recent development in pulley design by American Pulley Co., Philadelphia, Pa., said to offer important advantages to users of belt conveyors. Made with tight ends,



the Type "N" pulley is easily kept clean; no spilled materials or dust or water can accumulate inside it. Made of rolled steel, it is light in weight and practically unbreakable. Removable, interchangeable hubs assure quick, easy mounting. Pulley diameters, 6 to 36 in.

Bulletin CP-42, containing description, pictures and prices, is available from the manufacturer.

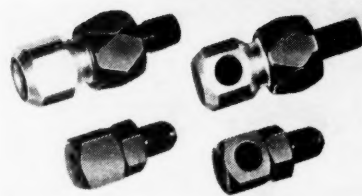
Welding Electrode

A new electrode designed specifically for all-position welding of mild steel with a.c. type welding machines has been developed by Wilson Welder & Metals Co., Inc., New York City, in the following diameters: 1/16, 3/32, 1/8 and 5/32 in. Physical tests are said to demonstrate that the quality of deposited metal of the No. 530 electrode is fully comparable to that of the best d.c. reverse polarity all-position electrodes, and average operators to have no difficulty in obtaining good fusion and complete penetration. The finished weld deposit is quite smooth and has a uniform surface contour.

Pipe Swivels

Trabon Engineering Corporation, Cleveland, Ohio, has introduced a new line of straight and 90-deg.-angle swivels for use in making oil, grease, air and other line connections between stationary and revolving, oscillating or other moving surfaces. These swivels are available in two different constructions for different requirements.

The standard ball-bearing swivels are available in 1/8-, 1/4-, 3/8-, 1/2-, 3/4- and 1 in. pipe sizes. Due to the ball-bearing construction, these swivels turn freely at any pressure without binding and are recommended by the manufacturer if space permits. The



stem and nut on which the balls turn are hardened to minimize wear.

Light-duty swivels, built without balls, are intended for use only in lighter work when space limitations do not permit the use of standard ball-bearing units; these are offered only in 1/8- and 1/4-in. pipe sizes.

Industrial Notes

PHILCO CORPORATION, Philadelphia, Pa., has received the new joint Army-Navy production award "for high achievement in the production of war equipment." Formerly manufacturing civilian radio receiving sets and refrigerating and air-conditioning equipment, Philco is now 100 percent converted to war work, producing communications equipment for tanks and airplanes, shells, fuses, and heavy-duty storage batteries.

NORMA-HOFFMANN BEARINGS CORPORATION, Stamford, Conn., has elected Clarence E. Stevens as vice-president in charge of plant operations. Until April 1 he was vice-president of Electrolux, Inc. He succeeds Charles B. Malone, resigned.

FAIRBANKS, MORSE & Co., Chicago, announces that Robert H. Morse, Jr., who has been branch manager successively of the company's offices at Cincinnati, Dallas and Boston, has become assistant sales manager with A. C. Dodge, vice-president and sales manager. John Elmburg, formerly manager of the diesel engine depart-



Army-Navy "E" Awarded I-T-E

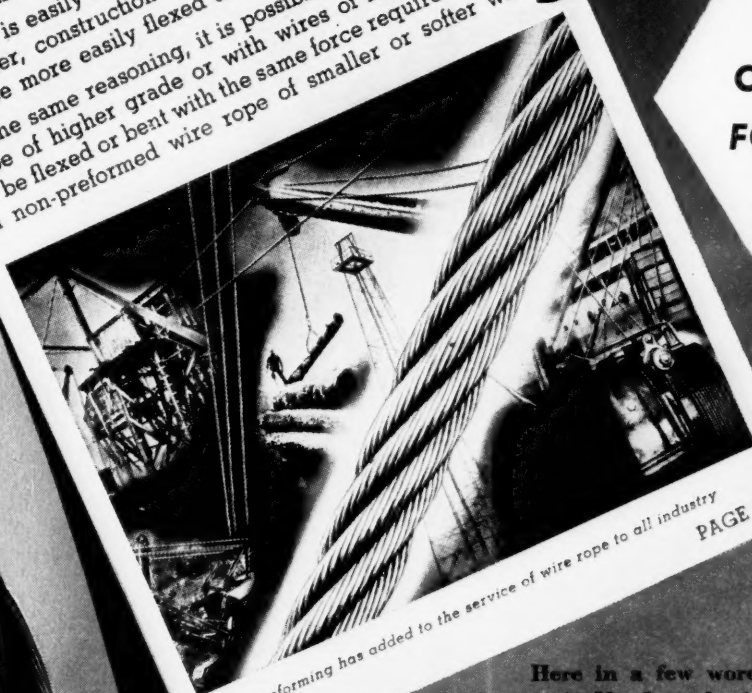
Rear Admiral Clark H. Woodward, U.S.N., retired, acknowledging the war reception of workers, officials and distinguished guests of the I-T-E Circuit Breaker Co., Philadelphia, Pa., prior to bestowing on the company and its employees the Army-Navy award for excellence in production Aug. 10. Left of the admiral is Mayor Bernard S. Samuel, of Philadelphia, one of the speakers, and W. M. Scott Jr., I-T-E president, who accepted the "E" pennant in behalf of the organization.

Why **HAZARD LAY-SET** *Preformed* Lasts So Much Longer

Wires of Preformed Rope are at Rest

The wires and strands of a **PREFORMED** wire rope are not under such internal stress. They are at rest, ready to bend in the direction required of them without offering opposition further than resistance in the metal itself. Thus, it is easily seen that, given two ropes of the same diameter, construction and grade, the preformed rope will be more easily flexed around the sheave or drum. By the same reasoning, it is possible for a **PREFORMED** rope of higher grade or with wires of larger diameter to be flexed or bent with the same force required to bend a non-preformed wire rope of smaller or softer wires.

**AND THEREBY
CONSERVE STEEL
FOR THE NATION**



Preforming has added to the service of wire rope to all industry
PAGE 89

Here in a few words the "MODERN WIRE ROPE DIGEST," America's No. 1 authority on wire rope, explains *why* Hazard LAY-SET lasts so much longer—gives so much better service—than ordinary non-preformed wire rope. Proper preforming gives LAY-SET amazing fatigue resistance; kink-resisting flexibility; makes it easier and faster to reeve; safer to handle. LAY-SET **PREFORMED** is the greater-dollar-value rope.

LAY-SET **PREFORMED** is backed by 96 years of rope-making experience and by a company that has clung so tenaciously to quality materials, manufacture and service that it has on its books many firms who have used Hazard ropes continuously for 40, 50 and 60 years. All Hazard ropes identified by the Green Strand are made of Improved Plow Steel.

HAZARD WIRE ROPE DIVISION

Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Fort Worth, Los Angeles,
New York, Philadelphia, Pittsburgh, San Francisco, Tacoma

AMERICAN CHAIN & CABLE COMPANY, Inc.
BRIDGEPORT, CONN.



HAZARD LAY-SET *Preformed* **WIRE ROPE**

ment at St. Paul, Minn., succeeds Mr. Morse as manager of the Boston branch.

HAYS CORPORATION, Michigan City, Ind., has appointed as its representative in Philadelphia territory the Energy Control Co., succeeding the Paul B. Huyette Co., Inc. The Energy company—J. T. Vollbrecht, president—has represented the Hays Corporation in New York for several years. Headquarters have been established at 3107 North Broad St. and Lee Myers, formerly of the American Engineering Co., will be associated with Mr. Vollbrecht. Other agency appointments are: Engineering Products Co.—F. E. Anderson, manager—in the southern West Virginia field with headquarters at 304 Davidson Building, Charleston; Power Specialty Co.—O. W. Muller, manager—southeastern Texas, with headquarters at 25 North Live Oak St., Houston.

GARDNER-DENVER CO., Quincy, Ill., announces that word has been received through the Japanese Red Cross that Francis R. MacNamara and Frank C. Bennett are in the Santo Tomas internment camp in Manila. Mr. MacNamara has been Gardner-Denver representative in Manila for two years and is well known in the Pennsylvania anthracite field, having been located in Scranton, Pottsville and Hazleton before going to Manila. Mr. Bennett

was general manager of Atlantic, Gulf & Pacific Co., a mining equipment house in Manila.

A. LESCHEN & SONS ROPE CO., St. Louis, Mo., announces the death of its president, Harry J. Leschen, on Aug. 2.

COCHRANE CORPORATION, Philadelphia, has appointed the Energy Control Co., Philadelphia, as flow-meter representative for eastern Pennsylvania, southern New Jersey, Delaware and Maryland.

WICKWIRE SPENCER STEEL CO. has named Edward F. Early, who has been superintendent of the Morgan works, as general superintendent of the Worcester (Mass.) district of the company, where he will supervise the Morgan, Goddard and Clinton works. He joined the company as an errand boy in 1910.

B. F. GOODRICH CO., Akron, Ohio, has formed a tire conservation department to help conserve rubber and render tire consultant service to truck fleet operators, with John T. Staker as manager. Contracts are negotiated with truck fleet operators and a service fee is based on the number of vehicle miles run, according to James J. Newman, vice-president. James E. Carhart, for many years a tire engineer in the truck and bus tire field, has been named assistant to Mr. Staker.

Conserving Truck Equipment Through Preventive Maintenance

"WITH the greater part of America's truck production consigned to the armed forces, and with new trucks for civilian use scheduled for strict allocation, it becomes imperative that trucks now on the road be kept at their highest peak of efficiency and be made to last as long as possible," states Mack Trucks, Inc. Proper maintenance and, in particular, preventive maintenance—the "stitch in time" that corrects small troubles before they develop into larger ones—thus assumes even greater importance in the truck operations of every company whether large or small.

"To large firms with hundreds of trucks, particularly those whose revenue is derived exclusively from truck operation, the benefits of preventive maintenance have long been known. Such organizations often have a considerable investment in special service tools and invariably give their truck equipment periodic checkups and adjustments. Other companies operating smaller numbers of trucks have not been able to do such a thorough job and in the case of companies whose trucks are only incidental to the conduct of their business, preventive maintenance has often tended to be of a haphazard nature or non-existent. It is to these latter companies that the following facts on preventive maintenance will be most applicable," Mack points out in stating that its "schedule of preventive maintenance incorporates an agreement whereby the owner brings his truck into the company's local branch shop at stated intervals, at which time competent mechanics inspect, check, tighten, adjust

and lubricate the chassis for a small nominal fee." After these check-ups, recommendations, if any, are made as to the need for minor repairs that should be attended to before they develop into something serious.

"The inspection system used by the Mack company can be applied to any make of truck" and "calls for periodic inspections at succeeding 1,500-mile intervals, with special and more extensive adjustments at each succeeding 6,000- and 18,000 mile marks.

"The 1500 mile interval service calls for the following:

ROAD TEST—For running condition and report on defects.

ENGINE—While warm inspect for fuel, oil and water leaks and tighten.

CRANKCASE—Change engine oil.

OIL FILTER—Replace if bag-type.

OIL PRESSURE—Check and report.

AIR FILTER—Wash in kerosene and oil.

FAN BELT—Check and adjust as required.

DISTRIBUTOR—One turn grease cup, using BRB grease (ball-and-roller-bearing grease).

GENERATOR—Add 8-10 drops light engine oil or one turn grease cups with ball-and-roller-bearing grease.

BATTERY—Check gravity. Add water. Clean and grease terminals.

CLUTCH—Adjust pedal-free motion, if necessary. Add BRB grease to release bearing if not prepacked. Add chassis-lube to yoke shaft.

TRANSMISSION—Add gear oil to level.

DRIVESHAFTS—Add gear oil to all open-type universal joints. Add short-fiber grease to slip spline. Add BRB grease to center bearing.

STEERING—Add gear oil to level of plug. Inspect drag link and drop arm

and add chassis-lube. Inspect tie-rod and add chassis-lube. Add chassis-lube to knuckles.

SHOCK ABSORBERS—Add chassis-lube to links.

BRAKES—Add brake fluid to master cylinder to level.

REAR AXLE—Add gear oil to level.

NOTE—Add any other items peculiar to your particular chassis.

REPORT—Any items requiring attention.

The above check-up is made at each succeeding 1,500-mile interval. In addition, at the 6,000-mile period, the following schedule is performed:

REPEAT—1,500-mile period schedule.

In addition:

CRANKCASE—Clean breather filter in gasoline, and oil.

OIL FILTER—Replace if can-type.

CYLINDERS—Tighten head stud nuts with tension wrench.

MANIFOLDS—Check and tighten nuts as required.

FUEL PUMP—Clean bowl (renew diaphragm at 30,000-mile periods).

FAN BEARINGS—Add BRB grease.

DISTRIBUTOR—Adjust breaker points. Check and set advance if necessary. Check wiring and report condition.

SPARK PLUGS—Clean and set gap.

GENERATOR—Check and set charging rate as required. Clean and tighten terminals.

STARTING MOTOR—Add 8-10 drops light engine oil. Clean and tighten terminals.

DRIVESHAFTS—Tighten universal-joint flange bolts. Check tightness of hubs on shafts and report.

SPRINGS—Tighten clip nuts. Inspect leaves and center bolt and report.

BRAKES—Add 2 oz. special light oil (low-pour test) to vacuum power cylinder.

REAR AXLE—Tighten stud nuts holding differential to banjo. Tighten axle-drive-flange stud nuts.

REPORT—Any other item requiring attention.

After the above schedule the 1,500-mile interval service is repeated until the next 6,000-mile period and then is repeated again until the 18,000 mile period, at which time the following schedule is fulfilled:

REPEAT—1,500-mile-period schedule and 6,000-mile period schedule.

In addition:

CRANKCASE—Remove pan and clean pan and parts.

ENGINE—Inspect and tighten supports if necessary. Check and tighten bell housing screws as required.

VALVES—Check and adjust tappet clearance if necessary.

COMPRESSION—Check each cylinder and report.

CARBURETOR—Clean thoroughly and adjust as required. Check and adjust fuel level if necessary.

COOLING SYSTEM—Flush and inspect hoses and report. Drain cylinder block as well.

DRIVESHAFTS—Check and tighten center-bearing lock nuts and frame bolts.

STEERING—Check gear and take up excess backlash if any.

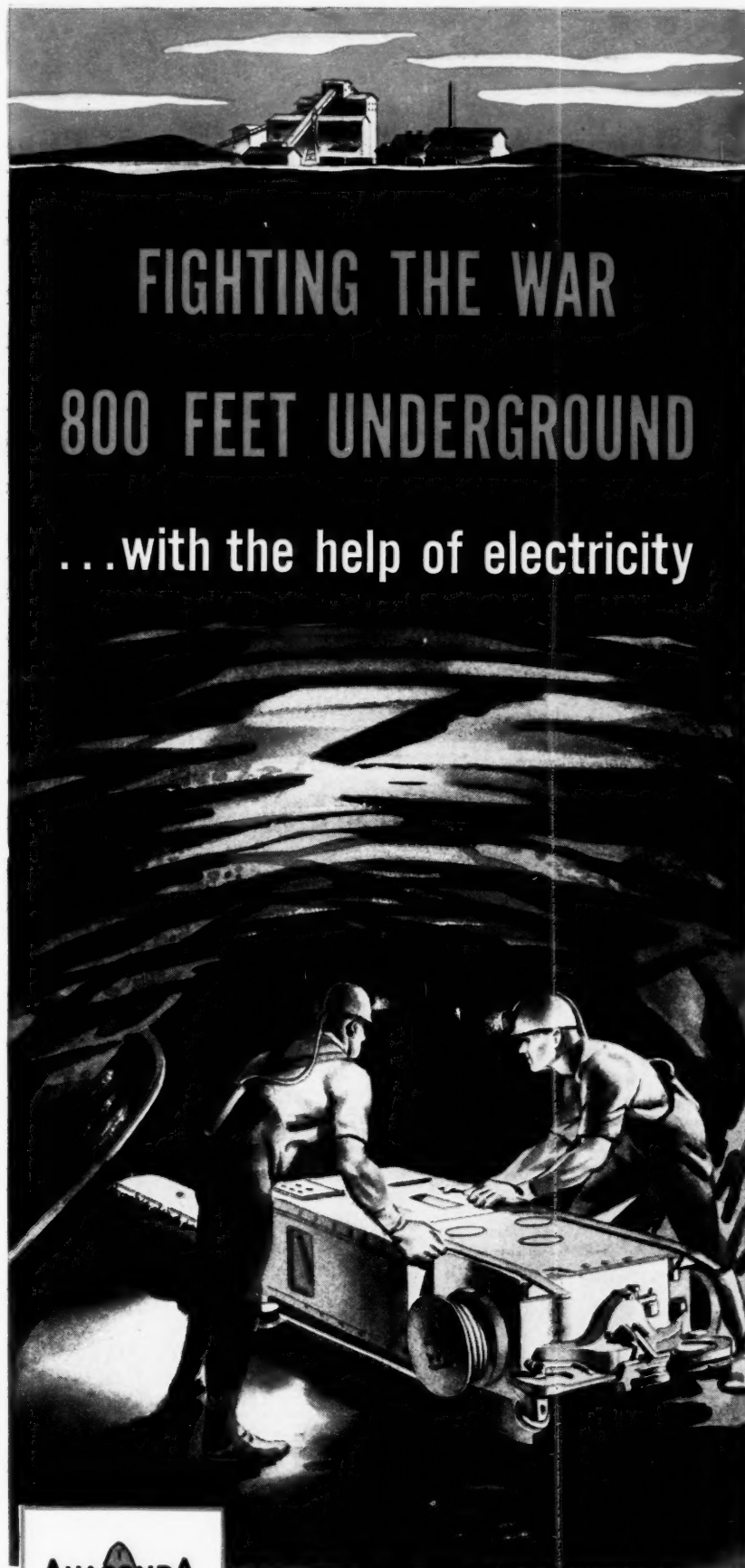
WHEELS—Check and set toe-in if required. Remove wheels and clean bearings. Repack bearings with short-fiber wheel bearing grease and adjust for proper end play.

BRAKES—Wash vacuum power cylinder air cleaner in kerosene and oil. Wash vacuum external valve air filter in gasoline and oil.

REAR AXLE—Check end play in pinion bearing and report. Check for excess backlash and report.

REPORT—Any other items requiring attention.

"After the above schedule has been performed the entire cycle repeats itself. It is claimed that in actual practice this 'Pre-



This familiar trade-mark symbolizes the best efforts of modern research and production.



Sunex Securityflex and Duracord

ANACONDA WIRE & CABLE COMPANY

In our nation's drive to victory, electrical power and the research-built Anaconda mining cables that carry it are helping vital mine production.

To keep mine production steady, operators use large quantities of electrical power . . . delivered through modern research-built wires and cables like Anaconda's tough, rubber-saving Duracord* and its all-rubber companion, Sunex Securityflex*.

Of particular interest today, with the conservation of rubber all-important, is Duracord. This construction was developed during the last war to meet the need for super-strength cords and cables. Its "fire hose" jacket, woven from long fiber cotton, makes Duracord tough on the outside—the weak spot in most cables.

The Duracord jacket makes possible rubber savings as high as 50% without sacrificing any efficiency. For further information, please write us immediately.

* Reg. U. S. Pat. Off.

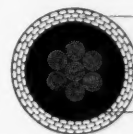
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ATTENTION!

Save Rubber with **DURACORD** without Loss of Efficiency

Here's a way you can effectively conserve rubber supplies and still get long-lived heavy duty electrical cords and cables . . . use Duracord.

This construction has served in some places for more than twenty years and it is still in use today. It is *not* a new construction.



— FIRE HOSE JACKET

— COPPER CONDUCTOR

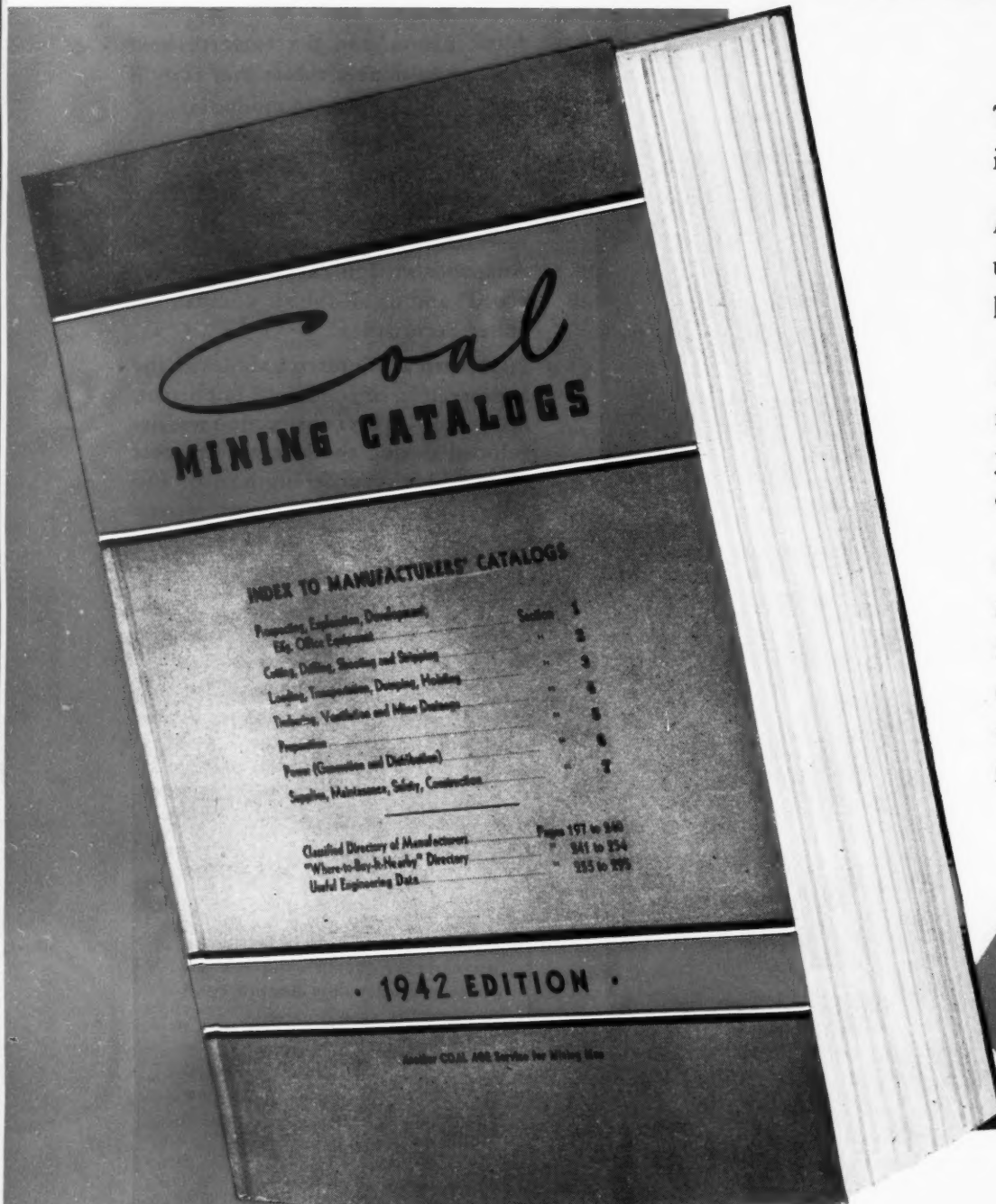
— RUBBER INSULATION

ANACONDA WIRE & CABLE COMPANY

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Subsidiary of Anaconda Copper Mining Company
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C.A., Sept., 42

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Company Name

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The nature of our operation is

Today, where every minute saved means increased coal tonnage for essential war effort, you'll find COAL MINING CATALOGS more helpful and useful than ever before in your specifying, requisitioning and buying. In improved sectionalized form, with the latest catalog data from manufacturers, this new 1942 edition is one catalog you'll keep right at your elbow for daily, speedy reference.

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If you are responsible for the specifying requisitioning, or buying at your mechanized property and you haven't received your free copy of the NEW 1942 EDITION, *request it immediately*. Write us on your letterhead, telling us about your property, or use the coupon below. We'll see that you receive your copy by return mail!

ventive Maintenance Plan' has on numerous occasions proved itself as one of the surest ways of detecting minor troubles which, if left unattended, would have resulted in breakdowns on the road with all the attendant expense and inconvenience. Properly maintained, your present trucks will render many additional thousands of miles of uninterrupted service. Today it is not only good business to conserve your truck equipment through periodic inspection, but it is also good patriotism. For each in its own way, every truck on the road today is doing its bit in America's drive for ultimate victory."

Carrying Capacity and Glaze In Brush Applications

Carrying capacity and glaze in brush applications is the subject of a second in the series of brush talks prepared by A. A. Stark, chief engineer, Ohio Carbon Co. The first appeared in the August Coal Age, p. 84. The text of the second follows:

"Carrying Capacity—The first thought when a machine is giving trouble is 'to get better brushes.' This is logical enough, but better brushes almost invariably are thought of as those having a higher current-carrying capacity, and this trend almost invariably brings about an improper application of brush materials. For example, we have developed a grade which has a lower percentage of metal than the brushes universally used and still there is ample carrying capacity for the normal load of the machine. It improves the performance of both the commutator and the brushes mechanically in so far as grooving and dusting is concerned, and at the same time gives good commutation electrically.

"Glaze—The principal cause of 'chatter' and 'copper cutting' is the brush material not being loaded up near enough to the normal working point, which causes a glaze to form on both the face of the brush and the surface of the commutator. This glaze eventually becomes very high in friction, and the first indication of trouble, after the noise, is grooving of the commutator because of the breaking down of this high-friction film. And during the process of breaking down, the oxidized polish of the copper is removed. Keeping a brush material loaded up to some where near its optimum current density insures that both commutation and brush life will be greatly increased."

Trade Literature

BEARINGS—Keystone Carbon Co., St. Marys, Pa. Folder cites salient features and advantages of Selflube porous iron bearings for various applications.

BLOWERS—Roots-Connorsville Blower Corporation, Connorsville, Ind. Bulletin 22-23-B-11, covering rotary positive blowers, gives installation views, details of construction, etc.

BLOW TORCHES—Turner Brass Works, Sycamore, Ill. Folder entitled "Turner Topics" provides information to enable



SOMEBODY'S HELPING HITLER!

IT TICKLES HITLER and his Ratzies every time a coalcutter cable is allowed to soak in a puddle of mine water. Yet it takes but a second to flip that cable over to a dry spot — adds valuable service time to its life.

Remember, cables are as vital as guns today. They're hard to get because of the squeeze on rubber and metals. So care for your cables for your country. Avoid severe kinking. Coil loosely when wet to speed drying out. Give the cable physical protection as far as practical. Effect repairs promptly. A repair in time may keep the mincutter cutting. To effectively repair damaged cable, trim back the fault to sound sheath, then tape and patch-vulcanize.

JOHN A. ROEBLING'S SONS COMPANY

TRENTON, NEW JERSEY

Branches and Warehouses in Principal Cities

ROEBLING MINE WIRES AND CABLES
HAVE ENLISTED FOR THE DURATION!

 MINE ENTRY CABLE	 MINE LOCOMOTIVE REEL CABLE <small>Loom sheath or all-rubber</small>	 TROLLEY WIRE
 MINING MACHINE CABLE <small>Loom sheath or all-rubber</small>	 BORE HOLE CABLE	 ARMATURE AND FIELD COILS <small>For Motor Repair</small>

PROMPT SHIPMENT TO MEET ESSENTIAL NEEDS

ROEBLING
ELECTRIC WIRES AND CABLES

ROLL 'EM UNDER

RETURN REELS AND SPOOLS PROMPTLY

users of blow torches to obtain maximum efficiency and service from them.

CENTRIFUGAL PUMPS—DeLaval Steam Turbine Co., Trenton, N. J. An elementary analysis of centrifugal-pump performance by H. Gartmann has been reprinted and is being distributed by DeLaval. The influence of blade angles and of areas of wheel passages upon the head-capacity curve is explained by means of simple diagrams, and it is shown how, once the characteristic curves of a given pump at a certain speed are known, it is possible to predict delivery, head and power requirements and efficiency at a different speed.

CORROSION-RESISTANT COATINGS—Carbozite Corporation, Pittsburgh, Pa. Folder contains concise descriptive information about Carbozite corrosion-resistant coatings with special emphasis on coal-industry applications.

CONTROL CENTERS—Trumbull Electric Mfg. Co., Plainville, Conn. Bulletin describes and illustrates entire line of control centers, including motor control centers and switchboard control centers. These centers consist of vertical troughs in which busbars carry power, into which are plugged combination units of magnetic starters and disconnects sizes 1, 2, 3 and 4, and switch and circuit breaker units of 30 to 600 amp. All these units are standardized and prefabricated.

CUTTING SCREW THREADS—South Bend Lathe Works, South Bend, Ind. Booklet—"How to Cut Screw Threads in the Lathe"—covers cutting of screw threads on back-gear screw-cutting lathes. Complete information is given on the various types of lathe tools employed in cutting screw threads, how to grind them, and how they should be mounted and positioned. The uses of the center gage, compound rest, thread-cutting stop, thread dial indicator, taps, dies, etc., are explained. Types of screw threads commonly used are fully described with formulas and diagrams of standard screw thread forms.

ELECTRICAL CONNECTORS—Burndy Engineering Co., New York City. Pocket catalog contains illustrations of 75 electrical connector types with when, where and how-to-use features also catalog listings and partial listings of important connector sizes. Helpful wiring data and many other important features are included.

GAGES—Certified Gauge & Instrument Corporation, Long Island City, N. Y. Catalog describes new line of Certified pressure, vacuum and compound gages, citing innovations and advantages.

LUBRICATING EQUIPMENT—Trabon Engineering Corporation, Cleveland, Ohio. Bulletin 424 describes a new line of straight and 90 deg. angle swivels for use in making oil, grease, air and other line connections between stationary and revolving, oscillating or other moving surfaces.

MACHINE TOOL ACCESSORIES—Ideal Commutator Dresser Co., Sycamore, Ill. Bulletin covers Ideal line centers, metal etcher, demagnetizer, grinding wheel dresser, balancing ways, variable speed pulleys, electric marker and portable cleaners.

MAINTENANCE AND SAFETY EQUIPMENT—Davis & Murphy, Chicago. Folder features Model GW machinery and motor cleaning and degreasing tool, Type XL skin guard (liquid), Lonn air saver blow gun valves, Big Beam No. 700 portable lamp, Justrite "twin-bulb" electric lanterns, Justrite safety cans, safety pumpless gasoline blow torch, industrial hose, flexible hose assemblies, Sellstrom eye and face shields, and Type A metal-cutting compound.

MANGANESE STEEL—American Manganese Steel Division, American Brake Shoe & Foundry Co., Chicago Heights, Ill. Bulletin 642-C details advantages of manganese steel for crusher, grinding and pulverizer parts.

PANEL INSTRUMENTS—Roller-Smith Co., Bethlehem, Pa. Catalog 4120 describes the company's line of 3- and 4-in. panel instruments. Various types of cases are illustrated, dimensions and listing of a complete line of shunts are given and RT current transformers for ratios up to 500/1 are illustrated and described. Dimensions and mounting details on all standard panel instruments are shown.

PRECISION LATHES—South Bend Lathe Works, South Bend, Ind. Catalog 16 completely illustrates and describes South Bend 16-in. toolroom lathes and 16-in. quick-change gear lathes. Attachments, accessories and tools for use with these lathes also are listed. Construction features are illustrated and specifications are tabulated.

RECTIFIERS—Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. Booklet B-3131 briefly describes the Ignitron rectifier and outlines its particular application to the mining industry. It states that there are no large rotating parts to require periodic maintenance and replacement; they are quiet in operation and will withstand heavy overload and repeated short circuits without increasing maintenance.

REPAIR AND RESURFACING COMPOUND—Central Paint & Varnish Works, Brooklyn, N. Y. Folder states that LCV-L-Floor, which comes ready mixed and ready for use, is a resilient finish that patches and repairs quickly; can be used on wood, concrete and other surfaces; is waterproof and weatherproof.

RUBBER GUIDE—B. F. Goodrich Co., Akron, Ohio. Booklet lists application and properties of many types of products for industrial and aeronautical purposes using natural, synthetic or reclaimed rubber. The booklet is divided into eleven indexed sections under the following headings: properties of Ameripol (synthetic rubber compounds developed by Goodrich), hydraulic equipment parts, sponge products, industrial rubber gloves, extruded rubber goods, Anode process of rubber coverings, industrial and aeronautical molded goods, hard-rubber parts, rubber cements, lathe-cut rubber goods, and properties of reclaimed rubber.

RUBBER LININGS—B. F. Goodrich Co., Akron, Ohio. Catalog Section 9000 covers Vulcalock rubber linings for handling corrosives and abrasives. Table lists over 100 of the most common services for which Vulcalock rubber linings are suitable and gives limits of temperature and concentration of the fluid in each case.

SELF-LOCKING NUTS—Elastic Stop Nut Corporation, Union, N. J. Wall chart explains the uses of various types of self-locking nuts. The center of the chart is devoted to an illustrated description of the basic principle by which a self-locking action is obtained. This is followed by illustrations of some of the advantages to be obtained by use of the nuts and cross-section drawings showing the method of application of the nine types most generally used, with corresponding halftones of these types.

SPRAY NOZZLES—Chain Belt Co., Milwaukee, Wis. Bulletin 409 is devoted to the Rex spray nozzle described as a non-clogging device which throws a fanlike, hard-hitting spray with such force that it removes dirt and grit from the most irregular surfaces. The high-velocity spray is said to be so concentrated that it produces an extremely thin line of impact which amounts to a sharp cutting action. Illustrations show various uses.

STEEL CHAIN—American Manganese Steel Division, American Brake Shoe & Foundry Co., Chicago Heights, Ill. Bulletin 742-CN contains technical data showing qualities and advantages of manganese steel chain for elevating and conveying.

TRACK-TYPE LOADERS—Jeffrey Mfg. Co., Columbus, Ohio. Catalog 767 illustrates and describes L-500 and L-600 high-capacity loading machines; the first-named for low-vein mines, the latter for mines with unrestricted height. Specifications are given and operation outlined.

VIBRATING SCREENS—Robins Conveying Belt Co., Passaic, N. J. Bulletin 122 describes Style M and Style J Vibrex screens. M is the larger and heavier unit, for floor or suspended mounting with single or multiple decks; Style J is smaller and lighter, for suspended mounting and, in standard construction, with a single deck only.

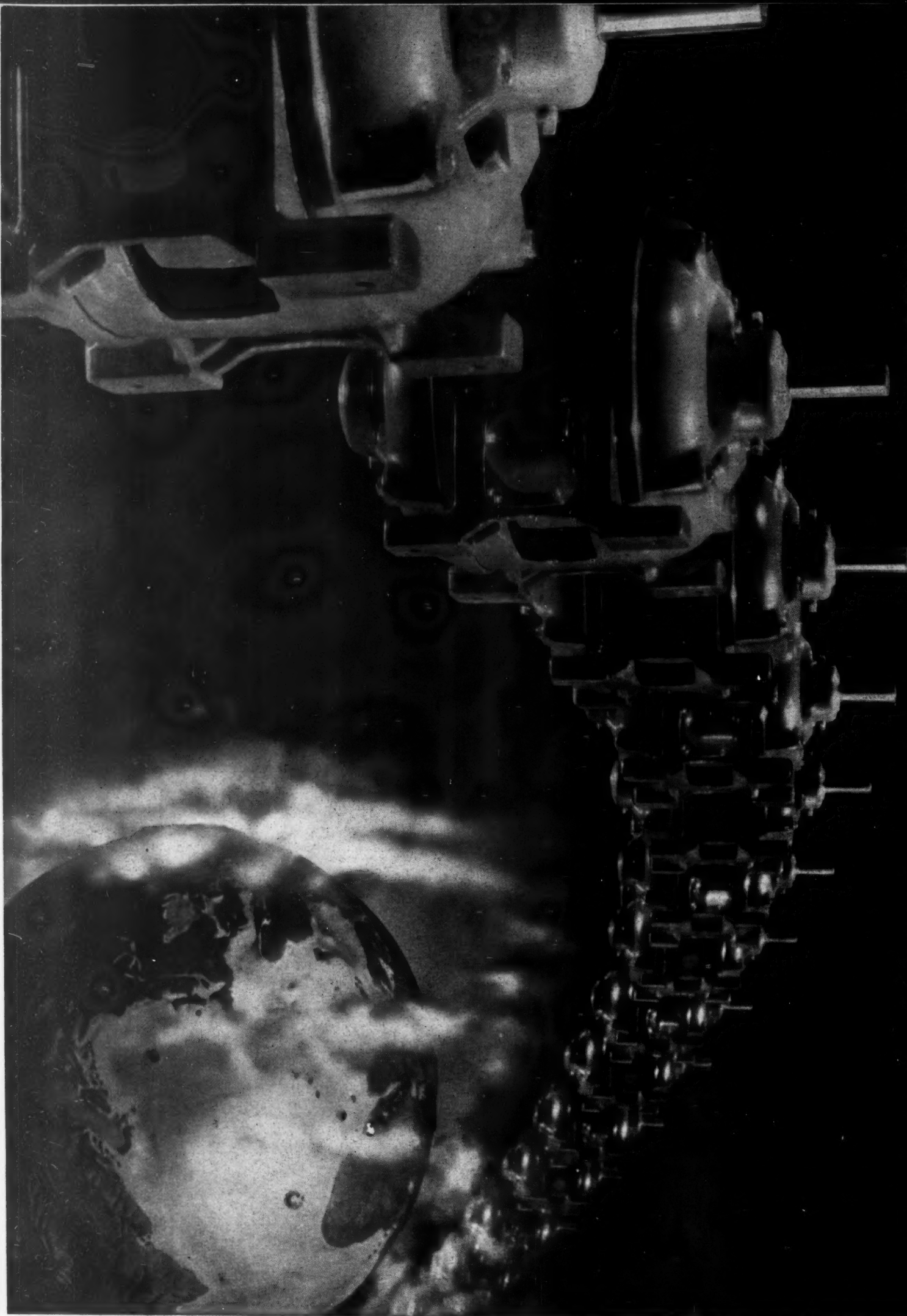
WELDING ELECTRODE CONSERVATION—Air Reduction Sales Co., New York City. Bulletin—"Make 3 Do the Work of 4"—consists of a series of shop posters designed to help arc-welding operators do more useful work with every electrode. Each poster—there are six in all—illustrates a common wasteful practice, then shows the corresponding good practice and points out the ease and simplicity of doing the job the right way. Posters are bound securely into the booklet, yet are perforated and can be easily detached and tacked on shop bulletin boards.

WELDING RODS AND ELECTRODES—American Manganese Steel Division, American Brake Shoe & Foundry Co., Chicago Heights, Ill. Bulletin 742W tells about Amisco Dieweld welding rods and electrodes for salvaging dies, tools, production of composite dies and tool and die alterations, giving suggestions for applying.

WHEELS AND ROLLERS—American Manganese Steel Division, American Brake Shoe & Foundry Co., Chicago Heights, Ill. Bulletin 842-WS gives extensive data on Amisco manganese steel for wheels and rollers for cars, conveyors, cranes, gears, sheaves, sprockets, etc., picturing and describing its use in a variety of applications.

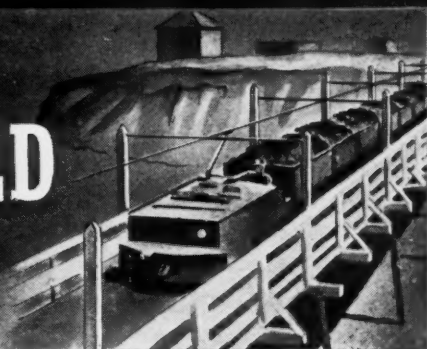


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MORE NEWS FROM THE FIELD



Usable Machines Ordered Saved: Drive for Scrap Pressed

While the government pressed its drive for scrap (August Coal Age, p. 48), setting a quota of 17,000,000 tons of iron and steel for the last half of 1942, steps were taken by Secretary of the Interior Ickes to prevent the scrapping of usable mining machines. Stating that valuable and non-replaceable mining equipment in working or repairable condition was being destroyed in the salvage drive, Secretary Ickes instructed all field engineers of the U. S. Bureau of Mines to prevent, if possible, the scrapping of second-hand equipment.

"Every piece of usable or repairable mining equipment is absolutely vital because it cannot be replaced," declared Secretary Ickes. "It would be a grave mistake to take this class of materials for destruction as scrap."

Power Expansion Program Revised by WPB Orders

Readjustment of the power expansion program was effected by issuance of a series of orders by the War Production Board on Aug. 21. The orders involve extensive revision of existing priority ratings on public and private power projects throughout the country.

All utility projects which are regarded as urgently necessary in the war program have been assigned higher priorities to assure their completion on schedule. In the case of the remaining projects, action has been taken so that they will not compete with immediate military requirements for critical materials and equipment, particularly those needed for the Navy and merchant ship programs, and including copper and steel. This has meant the halting of some projects and continuance of another group only to the extent possible on low ratings.

Of the projects to be assured completion, 5,500,000 kw. of new capacity is provided for the remainder of 1942, 1943 and, to a limited extent, early in 1944. Of this total, 3,400,000 kw. is private and 2,100,000 kw. is public. Work on projects totaling 2,200,000 kw., scheduled for operation in 1943 and 1944, has been stopped. Of this total, 355,000 kw. represents capacity on which priorities have been suspended subject to reinstatement in the future should changing power requirements dictate such action.

In addition, projects totaling 1,890,000 kw., scheduled for installation in 1943, 1944 and 1945 and authorized by Congress as part of the program for federal generating projects, are being reduced to low ratings or are being held to their present

low rated or non-rated status. Work on the low rated projects is permitted to continue, but only to the extent that it does not compete for critical materials and equipment needed for direct war uses. For the most part these federal projects are hydro-electric developments on which, unlike steam plants, some construction operations can be carried on without use of critical materials. The work done under the low ratings will facilitate expediting these federal projects later, if necessary.

Keeping Step With Coal Demand

Bituminous Coal Stocks				
	Net Tons	P. C.	From June 1 1942	From July 1 1941
Electric power utilities	16,876	+ 6.4	+68.9	
Byproduct coke ovens	9,866	+ 7.5	+66.8	
Steel and rolling mills	1,145	+ 4.2	+59.0	
Railroads (Class 1)	12,217	+ 6.4	+84.9	
Other industrials*	25,584	+11.2	+82.4	
Total	65,688	+ 8.2	+76.3	

Bituminous Coal Consumption				
	Net Tons	P. C.	From May 1942	From June 1941
Electric power utilities	5,200	+1.9	+ 1.2	
Byproduct coke ovens	7,229	-2.9	+ 5.7	
Steel and rolling mills	771	-5.9	- 6.8	
Railroads (Class 1)	8,921	-5.1	+17.8	
Other industrials*	11,678	-0.4	+11.3	
Total	33,139	-3.9	+ 7.3	

* Includes beehive ovens, coal-gas retorts and cement mills.

Coal Production	
Bituminous	
Month of July, 1942, net tons	47,700,000
P.e. change from July, 1941	+7.6
January-July, 1942, net tons	333,140,000
P.e. change from Jan.-July, 1941	+20.4
Anthracite	
Month of July, 1942, net tons	5,341,000
P.e. change from July, 1941	+10.0
January-July, 1942, net tons	34,848,000
P.e. change from Jan.-July, 1941	+9.7

Sales of Domestic Coal Stokers vs. Oil Burners		
	Coal Stokers	Oil Burners
June, 1942	11,365	2,098
P.e. change from June, 1941	-46.8	-90.9
January-June, 1942	50,593	39,360
P.e. change from Jan.-June, 1941	-23.3	-57.3

Index of Business Activity*	
Week ended Aug. 15, (preliminary)	184.7
Percent change from month ago	+ 0.4
Percent change from year ago	+15.6

* Business Week, Aug. 22.

Electric Power Output†	
Week ended Aug. 15, kw.-hr.	3,654,795,000
Percent change from month ago	+ 2.5
Percent change from year ago	+12.9

† Edison Electric Institute.

Britain Opens Fuel Battle To Avert Coal Shortage

Amid a nation-wide barrage of publicity, the British Government on Aug. 24 launched its "battle for fuel," designed to avert a coal shortage during the coming winter. The public was asked to fight and win this battle by a voluntary cut in household lighting and heating or submit to compulsory rationing.

An impending deficit of millions of tons of coal needed for war production must be met, Britain's citizens were told, and every householder is expected to reduce his use of coal, coke, gas or electricity by at least one-quarter of last year's consumption. Full-page or half-page announcements, complete with diagrams and charts, in all the national newspapers, gave the public its battle orders.

"The demands of total war make it essential to use less coal in our homes," the announcements said. "We must release fuel from the domestic front for war work and industry. The battle for fuel is on. . . . It is a vital battle. . . . Here are your BATTLE ORDERS. . . . Here is your fuel target for the next twelve months."

Mine Bosses' Union Opposed By Pennsylvania Authorities

In arguments Aug. 3 before the National Labor Relations Board on reopening Case No. R-3464 (Union Collieries Co., Oakmont, Pa., and the Mine Officials' Union of America, independent), representatives of the Commonwealth of Pennsylvania joined with those of various operators' associations in a request for reopening and reconsideration. The arguments resulted from a decision, one member, Gerard Reilly, dissenting, released to newspapers June 17 and ordering an election July 10 among four groups of supervisory employees that the Board found to be an appropriate bargaining unit. In the election, the union won by a vote of 44 to 5. Before the Board could issue formal certification, petitions to appear and be heard were filed by the various opposition parties.

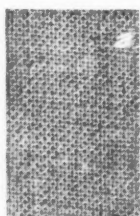
The attempted unionization "is an infringement of the sovereign power of the State," declared E. A. Delaney, Pennsylvania Deputy Attorney General. His belief that enforcement of Commonwealth safety laws would be seriously hampered if mine officials were allowed to form a union was echoed by Richard Maize, Pennsylvania Secretary of Mines. Reopening of the case was requested so that the Commonwealth could present its position.

Association representatives, among other things, pointed out that the operators

COTTON IS KNIFING deeply into burlap's wide domain while war keeps the big Indian monopoly textile at home. U. S. coal mines use about 20 million yards of heavy cloth yearly to control air currents—disperse gases, prevent explosions. Heretofore burlap got the job almost exclusively. Now cotton is taking over. A special, chemically treated, flameproof and mildewproof cotton fabric fills the bill. More than nine times as long as the burlap. They claim it lasts three to five times as long as the burlap.

From the Wall Street Journal,
Tues. June 23, 1942

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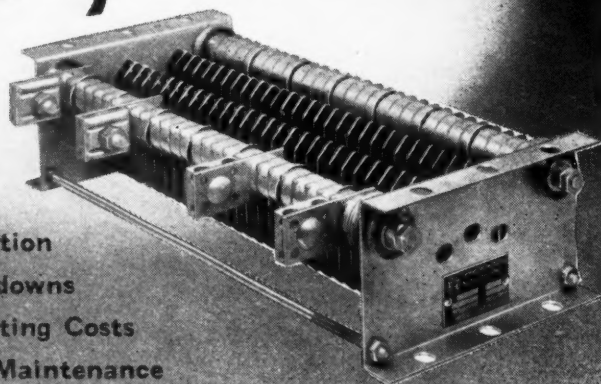
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could not be expected to have on their side supervisory employees on whom they relied to deal with the United Mine Workers if these supervisors were also members of a union. The possibility that the UMW also would enter the lists in case unionization of bosses was approved was pointed out by the dissenting board member, Mr. Reilly. Association and operator representatives included Charles O'Neill, Central Pennsylvania Coal Producers and the Somerset County Coal Operators' Association; E. R. Burke, Southern Coal Producers' Association; C. F. Taplin, Ohio Coal Association; and Don Rose, Union Collieries Co. and the Western Pennsylvania Coal Producers' Association. Dismissal of the intervention petitions and affirmation of the labor board's original decision was asked by Samuel Krinsky, counsel for the Mine Officials Union.

Previous activities of the union, according to data in the majority decision ordering the election, included negotiating in March, 1941, "an agreement with Ford Collieries . . . covering wages and other conditions of employment of supervisory employees of that company. It also negotiated an oral agreement covering supervisory employees with the Hillman Coal Co., Allegheny County, Pennsylvania, and has obtained substantial increases in wages for the supervisory employees of BRP Coal Co."

Smoke Elimination Law Upheld By Missouri Supreme Court

Sitting en banc at Jefferson City, the Missouri Supreme Court on Aug. 6 upheld the St. Louis smoke elimination ordinance. Denying a writ of habeas corpus for a defendant convicted of violation of the law, the court found that the ordinance is within the constitutional and statutory powers of the city and that the provisions of the ordinance are reasonable.

Robert M. Boyles, chairman of the special smoke committee of the Joint Council of Associated Engineering Societies of St. Louis, was appointed City Smoke Commissioner to succeed Raymond R. Tucker on Aug. 5. The appointment was made, with the approval of Mayor William De Becker, by Director of Public Safety H. D. McBride, whose department has supervision over the smoke regulation division.

Stoker Consumption Gains

Stoker coal consumption—now running at the rate of over 29,000,000 tons annually—has nearly trebled since 1937, it is estimated by *Coal-Heat*. On Jan. 1 last it was at the annual rate of about 27,540,000 tons; three years ago it was 16,450,000 tons; five years ago it was 10,487,000 tons. Sales of stokers of classes 1 to 4 (those feeding less than 1,200 lb. of coal per hour) in the first six months of this year increased the annual consumption of stoker coal at the rate of about 1,377,000 tons, a larger gain than in the first half of 1941. If the coal used in Class 5 stokers (feeding more than 1,200 lb. of coal per hour) and in locomotive stokers be added, the total is more than 100,000,000 tons

Combustion and Research Questions Analyzed At West Virginia Fuel Conference

Equipment Can Be Selected to Burn Coals of Any Type—Because Ash Slags at Higher Temperatures in High Oxygen Atmospheres, Coals With Less Favorable Characteristics Exceed Expectations—Allocation Discussed — Research as Revivifier — Pittsburgh Coal Bed Described

HOW and why low-fusion-ash coals, though they have only medium ash and sulphur percentages, often are the best fuels for the consumer's use, what progress the bituminous coal industry has made in research and what features characterize the Pittsburgh coal bed in West Virginia were major topics at the Fuel Engineering Conference held in the Mineral Industries Building, Morgantown, W. Va., July 24 under the sponsorship of the Coal Bureau of the Upper Monongahela Valley Association and the School of Mines, West Virginia University.

Where Medium-Grade Coals Should Be Preferred—Some have said, declared E. G. Bailey, vice president, Babcock & Wilcox Co., that too much coal of medium grade is being produced to satisfy the market, but, in his opinion, medium-grade coal is not so often "overdeveloped" as "under-sold," for it often can be purchased at such a figure for freight and mine cost that it is more economical to use it than a more perfect premium fuel that has to be brought from a distant source or is mined under less advantageous conditions, or has a higher calorific value, or a higher ash-softening temperature.

The first studies in ash fusion were made when coal was burned on grates and stokers, and the temperatures at which ash in that reducing atmosphere began to deform, become soft, and then fluid, rightly were stressed to the exclusion of the temperatures of the same changes of state in an oxidizing atmosphere. Today, however, when the slagging of dust around the tubes of the boiler has become a major consideration and when slag-tap and pulverized-coal methods are available for burning low-fusion-ash coals with satisfaction and efficiency, emphasis should be laid on the

same temperature determinations as exhibited when the ash is heated in an oxidizing atmosphere. These temperatures of deformation are much higher than those with reducing atmospheres and, with the new furnaces, many coals that otherwise would be uneconomical will be entitled not only to use but to preference at the prices at which they can be obtained. These newly determined facts are signifi-

cant to those whose coals were formerly not acceptable because of combustion or equipment limitations.

The characteristics of slag from different parts of a two-stage slag-tap furnace are shown in Fig. 1. This shows the relation of temperature characteristics to the nature of the iron compounds in the ash—that is, whether the iron is ferric, ferrous or metallic. The coal fired gives an ash of 13.6 percent iron as Fe. As usually analyzed this would show 19.4 percent Fe_2O_3 , but, as it may exist in slag as both FeO and Fe_2O_3 , Mr. Bailey considered it less confusing to give all percentages as Fe, designating how much of each is in the different oxide forms or more simply to show the percentage of Fe which is oxidized to Fe_2O_3 , the rest being FeO , with possibly a small quantity of metallic iron.

Pyrite Particles Congregate in Slag Bed—Slag sampled in the furnace at A, B and

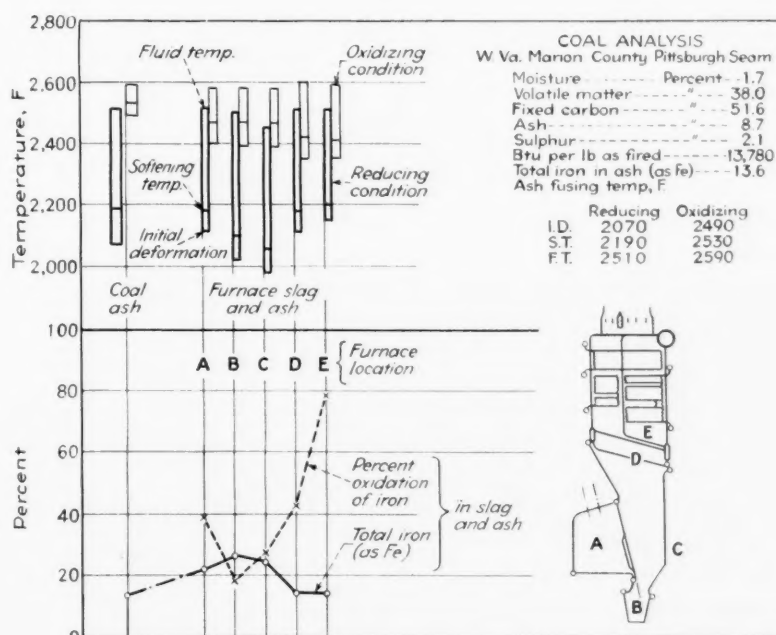


Fig. 1—Temperatures at which ash in various parts of a two-stage slag-tap furnace will deform, soften and flow in reducing and oxidizing atmospheres, respectively; also, percentages of iron and percentages of oxidation of iron in the same parts of the furnace.

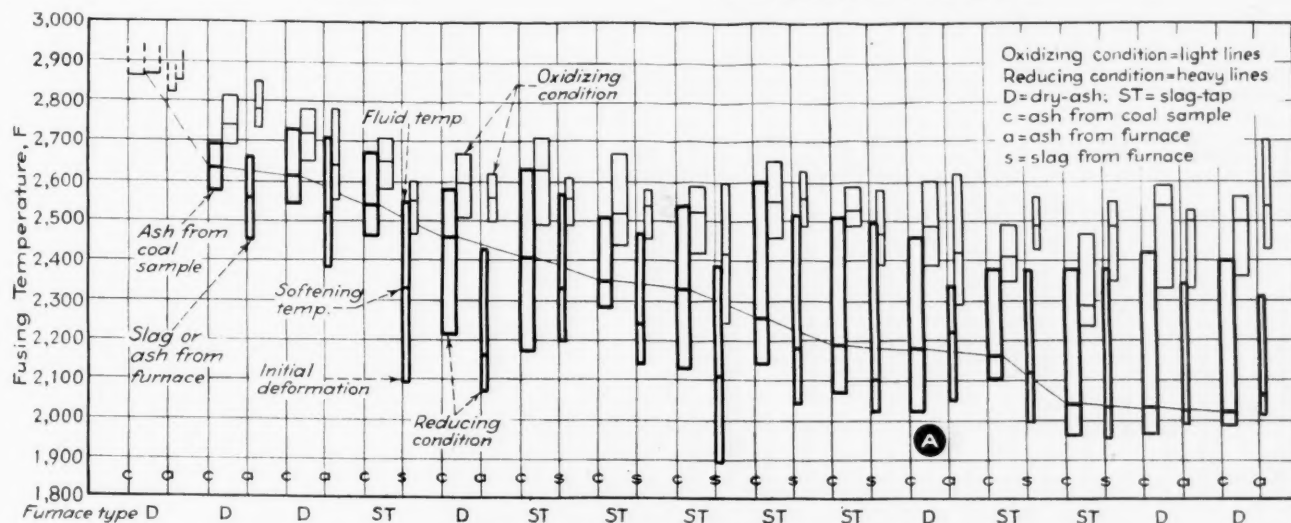


Fig. 2—Note how uniformly high are the temperatures at which the ash deforms, softens and flows in an oxidizing atmosphere. When burned in rich air, the coal loses much of its slagging tendency.

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C has much more iron than the original coal ash, because the pyrite particles, being coarse and heavy, gravitate to the slag bed and because the ash particles which have a high iron content are likely to be sticky and therefore will adhere to any surface with which they come in contact. The iron in the tapped slag, B, is the least oxidized of any; that is, only 19 percent of its iron is in the form of Fe_2O_3 and 81 percent is in the form of FeO , though the iron oxides, of course, are not free but in complicated silicate combinations with other elements. Ash collected in the boiler-tube bank, D, has about the same iron content as the ash in the original coal, and the further it travels in the gas stream the more it becomes oxidized. Usually that distance is about 60 ft.

Oxidizing Basis Preferred—For dry-ash furnaces, the initial deformation as determined in an oxidizing atmosphere is the best guide for the design of a furnace and the choice of a coal. Properly pulverized and with proper burner adjustment, the ash which reaches the wall, and even more markedly the tube bank and superheater, will be highly oxidized and should not fuse until it reaches a high temperature. But as it is desirable that the ash should not be sticky or vitreous even, the gases should be at temperatures at or below those which would cause initial deformation of the same cone in an oxidizing atmosphere.

For dry-ash furnaces, the softening temperature of the ash in coal is less important except that, when it and the fluid temperature are known, they suggest the points where vitreous slag may be formed from local flame impingement. This may occur even though no slag is formed in the furnace proper or in the tube bank. By making a furnace large enough or at least keeping its combustion rate low per square foot of exposed surface, dry ash can be obtained with a coal even though its initial deformation in a reducing atmosphere is only 2,120 deg. F. and in an oxidizing atmosphere is just under 2,400 deg. F., as in example lettered A in Fig. 2, where graphical representations for a reducing atmosphere are given in heavy lines and for an oxidizing atmosphere in light lines.

Fluid Temperature Is Preferred Index for Slag-Tap Furnace—The temperature at which the ash becomes fluid in a reducing atmosphere probably is the most important consideration in the design and operation of a slag-tap furnace and in determining the range of rating over which the boiler can be operated and tap its slag satisfactorily. But, the next important point is the adherence of the ash in the tube banks, and here the temperature of initial deformation in an oxidizing atmosphere again is the significant index.

For operating fuel beds and stokers, softening temperature in a reducing atmosphere undoubtedly is the best criterion. Because a large part of all the ash arriving at the tube banks is still coke, initial deformation temperature in a reducing atmosphere would indicate where "bird-nesting," or slugging in tube banks, would occur.

Evaluate Coals by Combustion Cost—

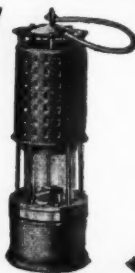
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We appreciate the Cooperation of the Coal Mining Industry in our plans to "help Employees help themselves".



Stearns

Suspended MAGNET at DUQUESNE PAYS FOR ITS OPERATION

This 65" Stearns Suspended Circular Magnet above the head pulley of the main belt conveyor at the Warwick mine of Duquesne Light Co. recovers enough scrap metal to pay for its operation.

But—the important feature of this magnet installation is that it protects crushers and, eventually, stokers.

Our many years of pioneering experience in profitably applying magnetic equipment for all industries should be your guide in the selection of better designed, most for the dollar magnetic machinery.



Spout Magnets



Magnetic Pulleys



Suspended Magnets

Magnetic equipment is a "must" in modern coal preparation methods whether it be Suspended Magnets (Bulletin 25) Spout Magnets (Bulletin 97) Magnetic Pulleys (Bulletin 302) or other types of magnetic separators (Bulletin 115).

**STEARNS MAGNETIC
MANUFACTURING CO.**
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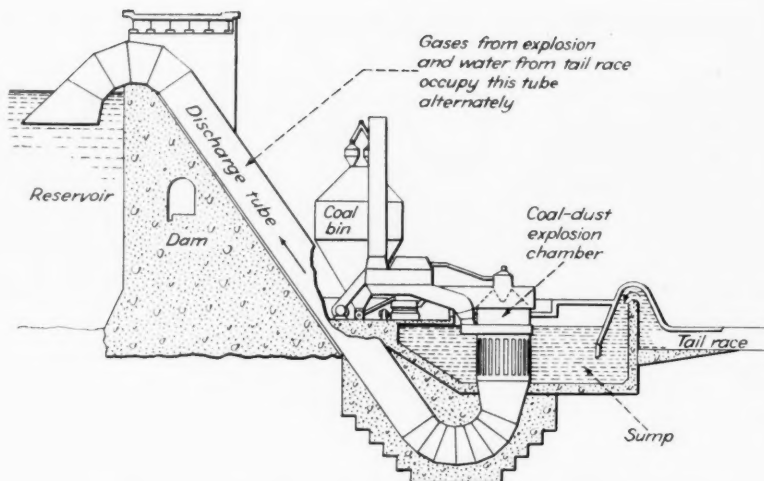


Fig. 3—Humphrey pump would suck water out of the tail race of dam and return it to reservoir for reuse in electric turbine.

The consumer should choose his coal by determining how much he will save by its use, having in mind the savings in the cost per pound of steam as produced by that coal and the necessary extra capital-expenditure charges that will enable him to get equal satisfaction in its use. The consumer should be urged to spend enough on his plant to enable him to burn fuels offered to him at such a lower cost as will repay this increased investment. In particular, emphasis should be laid on pulverized-fuel furnaces, which in 1941 consumed 45 million tons and probably will use 62 million tons in the present year. Stress should be laid also on the boiler plant being made large enough that furnace temperatures can be kept low enough to prevent birdnesting.

Shifts From Oil to Coal—In New England, declared Ollison Craig, manager, engineering department, Riley Stoker Co., coal is sometimes the more economical fuel and sometimes oil. He had been inducing consumers to provide for switching from one fuel to another so that they might take advantage of the best fuel values available, installing a combination unit for that purpose. In the immediate future, the consumer may have to take what the government will let him have "and like it." In a stoker, a little moisture in the coal will increase capacity, but with a pulverizer it will lower it, because the pulverizer cannot grind as much coal for the furnace, but the cure for this defect is to provide a pulverizer having excess capacity. Small units for burning pulverized coal are now being constructed. Mr. Craig showed a 150-hp. installation and one of 500 hp. which was being operated at 1,000 hp.

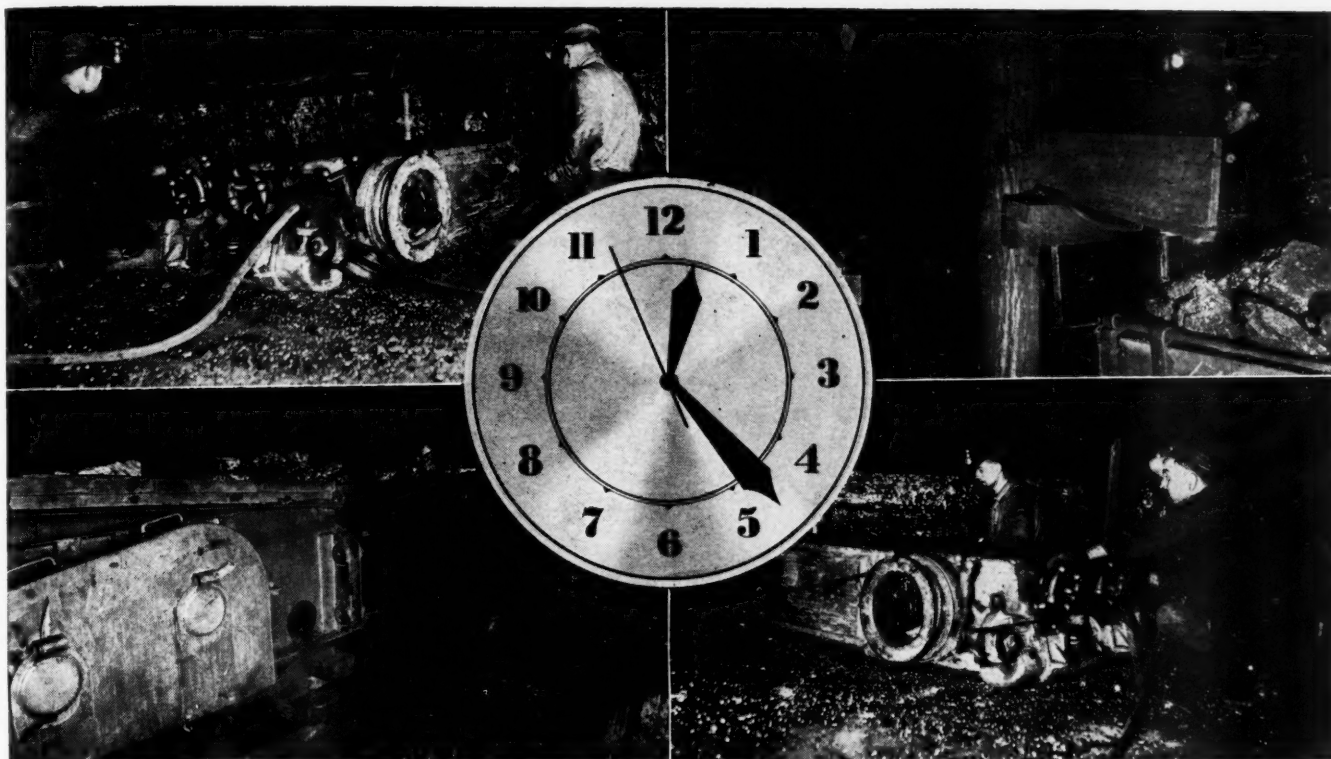
Modernizing Plant Broadens Choice of Coal—A plant built by the American Viscose Co. at Parkersburg, W. Va., in 1926, asserted Theodore Maynz, supervisor of power, had much the same equipment as some of the company's previous plants, but this equipment, though successful at the other plants, was not able to give satisfaction with local coals having the better fuel values; so much so that it was necessary to burn premium fuel from another district at an increase in price at the mine and in freight charges.

Boilers and stokers guaranteed to produce 90,000 lb. of steam even with low-ash, high B.t.u. fuel produced only 65,000 lb. The installation had an all-refractory setting, an inclined front arch and no boiler slag screen, conditions that tended to high furnace temperatures and to consequent slagging of ash and plugging of gas passages. Even at low ratings, the stoker "froze" with molten ash. Addition of Ljungstrom air preheaters designed to provide air at 395 deg. did not help the stoker and furnace, even though the air temperature never exceeded 275 deg. F.

The Edge Moor boiler had 10,000 sq. ft. of heating surface, the stoker 200 sq. ft. of projected area including clinker grinder and the furnace a volume of 30,300 cu. ft. Based on 90,000 lb. of steam output and 13,300-B.t.u. coal, the burning rate would be 50 lb. per square foot and the heat release 43,000 B.t.u., making the performance guarantees quite optimistic.

Added Pulverized-Coal Units—In 1930, more steam was required, and a new "Combustion" steam generator was installed with the bin system of handling pulverized coal. The boiler has 10,160 sq. ft. of heating surface with a furnace volume of 7,500 cu. ft., a total of 1,610 sq. ft. of water walls including bottom slag screen, and a refractory front wall. It was designed to produce 120,000 lb. of steam with the aid of a small economizer ahead of the plate air heater. In this unit, local 3-in. slack has always been used as fuel. Two years later, an almost identical unit was added but without the economizer and with the water-wall surface increased to 1,730 sq. ft.

Put In Stoker-Fired Units Also—Studies made in 1940 showed that, for economy, the stoker-fired boilers should be converted so that they also could burn the local fuel. The excessive cost of rehabilitation, the necessary increase in air preheaters, the addition of dust collectors, the consequent expense of larger induced-draft and forced-draft fans and drivers and lack of space prevented the use of pulverized coal. As traveling-grate stokers were too large for the existing boilers and building steel, it was decided again to use underfeed stokers, but of a type suitable to local fuel. This fuel was burned without difficulty at a rate of about 45 lb. per square



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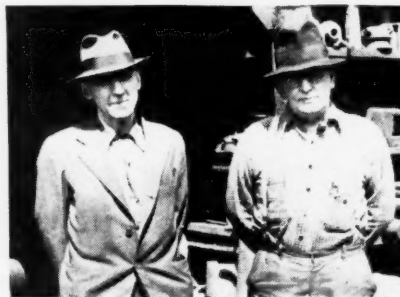
J. A. Mehle, master mechanic; Frank Jermance, engineer; L. E. McDaniel, chief electrician; G. A. Emerine, bookkeeper, Canon National Coal Co., Florence, Colo.



Oscar R. Carlson (left), general foreman, and Bill Styles, superintendent, Foley Bros., Inc., Colstrip, Mont.



Harvey Hiber (right), superintendent, and Mike Hudina (in rear), tippie boss, Pacific Coast Coal Co., Black Diamond, Wash.



E. M. Brook (left), chief electrician, and J. G. Cadwell, shop foreman, Northwestern Improvement Co., Roslyn, Wash.



George B. Jackson, superintendent; E. O. (Bill) Jackson, foreman; Ray Robbins, chief engineer; Fred Wray, assistant chief engineer; Thomas Hughes, chief clerk; W. C. Painter, master mechanic, Independent Coal & Coke Co.



Thomas Murphy (left), general superintendent, Northwestern Improvement Co., Roslyn, Wash.; D. R. Swem, general manager



Left to right: W. O. Swift, Wilkeson-Miller Coal Co.; L. J. Marsh, chief clerk, Wilkeson Products Corp.; Griff Perry, Wilkeson-Miller; W. A. (Tug) Wilson, Wilkeson Products, all of Wilkeson, Wash., and E. R. McMillan, mining engineer, Northwestern Improvement Co., Seattle, Wash.

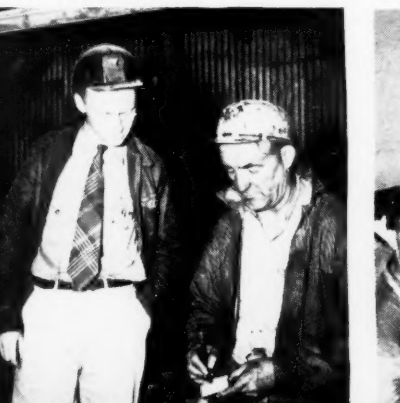


A. C. Hazen (left) chief clerk, and E. J. Erickson, master mechanic and chief electrician, Giffen (Mont.) coal mines, Great Northern Ry.

M. K. Petty (left) and C. A. Rome, owners, Ashland Coal Co. truck mine, Cambridge, Ohio

D. K. Chapman (left), mine foreman; G. D. Patterson, vice president; and J. B. Penman, superintendent, Greenbrier Smokeless Coal Co., Charmco, W. Va.

J. W. Mullins (left), general mine foreman; W. W. Fitcher, Jr., assistant superintendent; T. F. Dolinger, superintendent; Roark, chief electrician, Borderland (Va.) Collieries Co.



Coal Men Ed on the Job



Hal Taylor, chief electrician, Castle Gate No. 2 mine, Utah Fuel Co.



L. Berenson, night foreman; Jack Smith, Dick Ferremond and Oscar Pehrson, section bosses; J. L. Carr, conveyor foreman, Independent Coal & Coke Co.



Lewis Jackson, shotfirer; Carl Smith, night foreman, Oliver Coal Co.



Left to right—R. C. Oliver, president; A. T. Wiley, loader foreman; Claude Davis, cutter; Ed Schoneman, master mechanic; Theodore Valin, electrician, Oliver Coal Co.



R. C. Oliver, president, and J. O. Hovgard, sales manager, Oliver Coal Co.



Left to right—Douglas Hardin, assistant manager; J. J. Neish, superintendent; Fred Elkins, master mechanic and chief electrician; L. D. Hardin, general manager, Alpine Fuel Co.



Wesley Hyatt and Walt Whitaker, engineering staff, Castle Gate No. 2 mine, Utah Fuel Co.



Andrew Dougherty, Mike DeAngelis, A. R. Johnson, M. C. Carr, Frank Kochevar, J. H. Phillips, L. I. Arnett, John Ungricht, Fay Thacker, William Monks, John C. Parry (night foreman) and Earl Stevenson (day foreman), Castle Gate No. 2

Lloyd Catlin, section foreman; Don Newberry, assistant foreman; Alison Marshall, ventilation and timber supervisor, Independent Coal & Coke Co.

Wesley Bruce, preparation manager; Eldin Conover, assistant top foreman; Herb Wood, top foreman, Independent Coal & Coke Co.

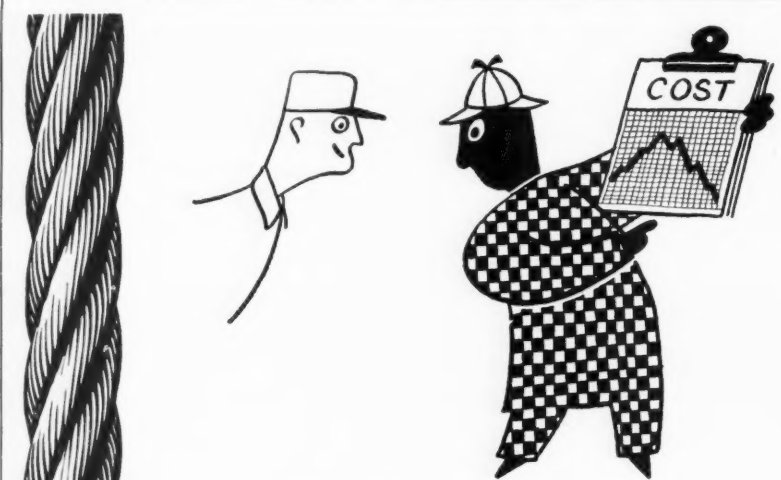


Sam Fratto, safety engineer, Independent Coal & Coke Co.

by Editors on the Job

Westerberg, preparation engineer; A. Houghton, day tippie foreman; Earl Warren, master mechanic, Castle Gate No. 2 mine, Utah Fuel Co.





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CENTRIFUGAL BLOWERS AND COMPRESSORS GEARS WORM HELICAL AND FLEXIBLE COUPLINGS

foot of projected area, though combustion rates should not exceed about 40 lb. per square foot.

Experience shows that, with a proper choice of equipment, medium-ash coals of medium B.t.u. are preferable to better coal if the equipment is selected to suit the characteristics of the coal and if the coal is obtainable at sufficiently lower cost. The Parkersburg plant of the Viscose company had been able to get suitable results with both pulverized fuel and underfeed stokers when using such fuel, and Mr. Maynz could see no reason why a spreader stoker would not burn such coal successfully if the furnace were correctly designed, though he did not know of any medium- or large-size boilers so equipped. However, Fred Kasper, Koppers Coal Division, Eastern Gas & Fuel Associates, said much of such coal is being burned in that type of equipment.

Try to Avoid Allocation—Allocation of coal by government order may confront us, but Howard A. Gray, Acting Director of Solid Fuels Coordination for War, wants to avoid it if he can do so, said Dr. A. C. Fieldner, chief, Fuels and Explosives Service, U. S. Bureau of Mines. Mr. Gray realizes it will take a big force to handle the job and prefers to meet it by measures that will prevent peaks of coal demand and peaks of transportation. A group of men already in Washington and engaged in other work is following up the situation, so that they will be ready to allocate coal intelligently should allocation become necessary. But to do this a large number of men would have to be added to the present group, though acting under its direction.

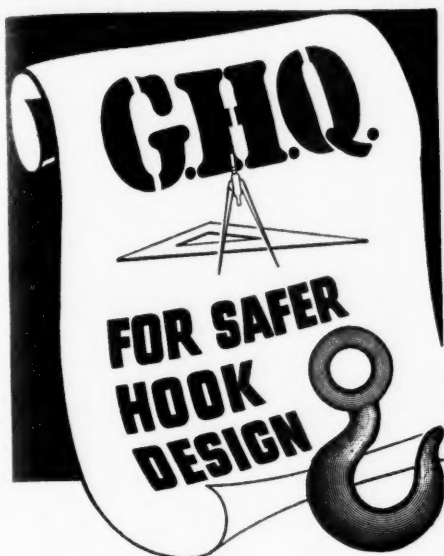
Styrene Makes Rubber


Coal men will be pleased to know, Dr. Fieldner said, that Buna-S, the synthetic rubber which is suited to tire manufacture, is 25 percent styrene, which will be made from coal. Butadiene, which polymerizes to synthetic rubber, can be made from oil, coal or agricultural products. Which should be chosen is a matter of relative cost.

Neglect of Research a Costly Error—Industry a few years back could neither afford to engage in research nor afford to go on doing business without it, asserted Julian E. Tobey, director, Coal Bureau, Upper Monongahela Valley Association. Today, he declared, it was possible to find funds for research and such work was now being done. The board of directors, said H. N. Eavenson, president, Bituminous Coal Research, consists of a majority of one of appointees of the National Coal Association, with the rest financial contributors to the research organization.

It is hoped, he added, to investigate diesel locomotives for coal use, as it has been found that they can be constructed at about the same cost as electric locomotives, will eliminate the fire risk that accompanies trolley haulage and save trolley and bonding expense. Some studies of the nature of those described by Mr. Bailey in his address also should be made as funds permit.

Fight Research With Research—Markets have been lost to rival fuels, said R. A. Sherman, supervisor, Battelle Memorial Institute, because the rivals of



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coal have made the researches that have enabled them to design such equipment. Research has "made" them and can enable the coal industry to meet their rivalry. Of all parts of coal, declared G. W. Land, fuel engineer, B.M.I., fusain has been found most absorbent of oil. When coal is treated with calcium chloride, the moisture added from the atmosphere decreases as the inherent moisture content of the coal increases. On coals having more than 8 to 10 percent inherent moisture, calcium chloride is not expected to be effective in reducing dustiness. If coal treated with calcium chloride is corrosive, the corrosion may be due to the water that the calcium chloride attracts and not to the reagent itself. W. B. Ramsdale introduced the B. C. R. residential stoker-Mr. Sherman, the Battelle residential stoker; R. B. Engdahl, the use and development of equipment for metallurgical furnaces; and B. A. Landry, the pulverized-coal-operated pump.

Pulverized-Coal Engine—For a long time it has been hoped to drive machinery by the explosion of coal dust. The diesel oil engine was originally planned for use with pulverized fuel, but the difficulties encountered prevented the use of that power source. The Humphrey pump was designed for use in waterworks but can be used for returning, for power purposes, the water in the tail race of a dam to the reservoir from which it came. Humphrey pumps are to pump water from the River Lee at Chingford, England, using producer gas as motive power, but that is an expensive fuel, more costly than pulverized coal.

Coal-Dust Pump Operation

The principle of the pump is that the explosion of the coal dust drives the water into the upper pool through a U pipe resembling a penstock. With this arrangement the piston, being water, always fits the cylinder perfectly. The temperature of the scavenging air which is admitted between explosions is raised by a heat-exchanger which derives its heat from the products of combustion. A full-sized 4,500-kw. plant to use 2½ tons of pulverized coal per hour has been designed. Several locations for the pump are under consideration, and it is expected that one will be constructed in the near future to produce power for the war effort.

Consumers Stock Coal—The Office of Solid Fuels Coordinator for War, asserted T. J. Thomas, Associate Director, has urged that industry put not less than a 60 days' supply of fuel in storage and that electric utilities store enough for 90 to 100 days. At present, about 67,000,000 tons of coal is in storage, equal to a composite average of 49 days' supply for the so-called basic industries of the country.

Pittsburgh Coal in West Virginia—Of the Pittsburgh coal bed where it now exists in thickness of 3 ft. or over, said Mr. Eavenson, about 38.7 percent is in West Virginia, 41.6 percent in Pennsylvania and 18.8 percent on the west side of the Ohio River. The bed in West Virginia extends with some interruptions from Hancock County in the north to Cabell County in the south and from Preston County westward to the Ohio

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River. It also is mined in Mineral and Grant counties in the eastern panhandle. Found in minable thickness in 26 counties, it has been opened for commercial or local purposes in 22 of them. It is the most important coal seam in West Virginia and, including 1941, has produced about 798,000,000 tons, with a value at the mine of about \$1,324,000,000.

Nearly all Pittsburgh-bed coal in West Virginia is high-volatile, although small areas in the two eastern counties (Mineral and Grant) have low-volatile coal; only 2 percent of all the analytical tests made are under 31 percent volatile. About 40 percent show an ash content of 6 percent or less and 70 percent of 8 percent or less. Sulphur content varies greatly, sometimes quite markedly in short distances. Of all analyses, 10 percent have 1 percent of sulphur or less and 40 percent 2 percent or less. Its B.t.u. values range from 11,300, as received, to 14,700; only 2 percent of the analyses showing less than 12,500 and 9 percent less than 13,000 per pound.

"A prominent citizen of Clarksburg told me," said Mr. Eavenson, "of a tract near there bought by his grandfather in 1856, for \$200 per acre, which he had seen sell since for \$2,000 and later at \$50 per acre. A few years ago I saw a tract for which \$1,500 per acre had been paid which now, although it has been developed, cannot be sold for \$300 per acre. During the last few years, in all the counties having the Pittsburgh bed, thousands of acres, as much as 35 percent of the area in the county, have been delinquent and sold for taxes."

Pittsburgh Bed Springs No Surprises—No seam of coal in this country has perhaps as great a horizontal continuity and such a relative regularity of structure as the Pittsburgh bed, which extends, though with some eroded areas at the eastern end, from the Potomac basin in western Maryland into West Virginia and Ohio, declared Dr. Paul H. Price, geologist, State of West Virginia.

AREA AND AVERAGE THICKNESS, PITTSBURGH BED

State	Area, Sq. Miles	Average Thickness in Area Included, Ft.
Pennsylvania	2,126	7
West Virginia	2,609	5
Ohio	1,590	5 (about)
Total	6,325	

The greatest bed thickness is in the northern and eastern parts of the area, with a maximum of 22 ft. in Maryland. Toward the southwest, in what probably was the deepest part of the coal basin, it is, however, thin or actually wanting. The original extent of the seam covered an area almost certainly greater than 15,000 square miles; thus more coal has been removed than now remains.

Declining to decide whether the metamorphism which deprived the coal of much of its volatile matter was due to pressures from the East, Dr. Price said that not only was the bed thicker in that direction but that the other beds thickened in that area also, so that they appear to have had their greatest depth of burial at their present eastern limit. He also concluded, as between the theories of White (devolatilization by pressure from an upheaval to the east), Fuchs (chemical differentiation soon after deposition) and Hilt (devolatilization by depth), that "a theory acceptable to all which will account for the different ranks of coal is yet to be advanced."

Other speakers were A. C. Spurr, secretary, Upper Monongahela Valley Association, Coal Bureau, and Dr. Charles E. Lawall, president, West Virginia University, who declared that the Fairmont region must not coast down in the good times now experienced but go on pulling as hard as in bad times. Sled riders get hurt only when coasting downhill. Now is the time to develop an extensive chemical industry with Monongahela coal as a base. Mr. Tobey and Mr. Bailey acted as chairmen of the two sessions.

Steps Taken to Halt Coal's Manpower Losses; Miners Ask Cost-of-Living Wage Increases

(Continued from page 40)

Employment Service; provide special consideration for metal miners by tire-rating boards; and prevent "pirating" of metal miners by war plants.

Pirating in general was the subject of a special set of rules regarding transfers from one industry to another issued by Commissioner McNutt late in July. Upon declaration of an area as critical from the standpoint of employment, these rules forbid soliciting transfer of workers except through specified methods designed to prevent pirating.

The growing shortage of manpower in coal mining was marked in August by the formation of an operator-miner committee to confer with McNutt and Hershey in an effort to stop further loss of men in critical occupations to other industries and the armed forces. The committee was

named by Solid Fuels Coordinator for War Ickes upon recommendation of the Solid Fuels Advisory War Council. It is composed of H. T. DeBardeleben, president, DeBardeleben Coal Corp., Birmingham, Ala.; O. L. Alexander, president, Pocahontas Fuel Co., Inc., New York; Charles O'Neill, vice-president, Barnes & Tucker Co., New York; Thomas Kennedy, secretary-treasurer, United Mine Workers of America; and T. J. Thomas (ex-officio), associate director, Office of Solid Fuels Coordination for War. At the end of the month, the committee was gathering data in preparation for active representations to the appropriate officials and agencies in Washington.

Operator-miner participation in plans to increase bituminous output by raising efficiency, reducing absenteeism and similar

COMING MEETINGS

• Joint meeting of Coal Division, A.I.M.E., and Fuels Division, A.S.M.E., Sept. 30-Oct. 2, St. Louis, Mo.

• Illinois Mining Institute: fiftieth annual meeting, Oct. 23, Hotel Abraham Lincoln, Springfield, Ill. Details of the program will be available in the near future. Meanwhile, anyone interested may communicate with B. E. Schonthal, secretary-treasurer, 28 East Jackson Boulevard, Chicago.

• National Safety Congress and Exposition: Oct. 27-29, Sherman, LaSalle and Morrison hotels, Chicago (postponed from Oct. 2-4).

measures increased in tempo in August. Week-end bouts with John Barleycorn also came in for increased attention. In the Harlan field of Kentucky, according to George S. Ward, secretary, Harlan County Coal Operators' Association, excessive drinking is a major factor in failure to achieve desired production goals, along with pirating by other industries and the operations of the draft and recruiting agencies. Aid to Harlan operators was promised by the U. S. Employment Service, including sending workers into the county from other sections if needed.

In line with steps in many other fields (August Coal Age, p. 49), operators in the Hazard and Big Sandy-Elkhorn fields, in cooperation with the United Mine Workers, got actively behind the organization of "Victory Production Committees." General supervision will be exercised by a four-man committee, represented by two field men, according to reports. Six-man local committees for each of the mines in the districts are planned, with equal miner and operator representation on each committee. Among their other troubles, eastern Kentucky fields also were reported to have been suffering severely the past two months from excessive rainfall and floods. In Virginia, Governor Colgate W. Darden, Jr., and Commissioner of Labor and Industry John Hopkins Hall, Jr., joined in the work by issuing a proclamation urging miners to work every day the plants run.

Efforts to raise the output of anthracite brought reports that the production-allocation plan set up by State law might be abandoned. Stimulation of anthracite tonnage was the objective of a series of meetings held late in July and early in August and attended by representatives of the War Production Board, the State administration, operators and miners. By Aug. 10, the WPB reported, 84 labor-management committees had been organized at anthracite mines, bringing to 1,200 the number of plants of all types in the United States in which war-production drives are in progress. Development of the movement was marked by proposals that the miners go on a six-days-per-week working schedule and on such individual actions as



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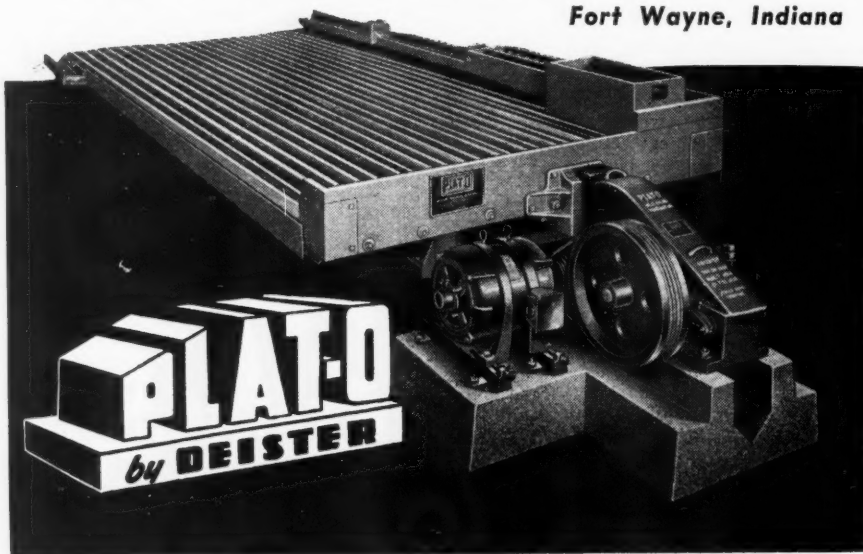
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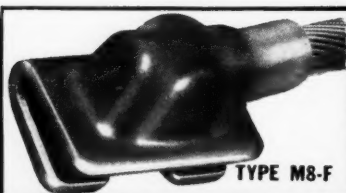
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the lifting of the limitation on cars loaded by Local Union 1221, Wilkes-Barre, Pa.

Anthracite developments also were marked by a demand for a pay boost to meet increased living costs by the executive board of District 1, UMWA. The anthracite contract provides for reopening by either party at any time for discussion of wage revisions. No hint had been given by union headquarters in Washington at the end of the month as to whether steps would be taken to open negotiations.

A wage increase of 50 percent also was requested in the bituminous industry by 36 locals in District 2, central Pennsylvania, which adopted resolutions Aug. 24 requesting reopening of the contract to take care of increased living costs. The 36 locals were reported to represent 23,500 miners out of 55,000 in 200 locals in the region. The move, said James Mark, district president, was not one of the UMWA.

Bituminous strike developments in August included the settlement of a walkout of 800 men at the Whitwell mine of the Tennessee Products Corp., which began July 20 in a controversy over car size. Early in the month, also, employees of the Harman Coal Corp., Harman, Va., struck over the movement of two loading machines from one operation to another. After intervention by Sam Caddy, president, District 30, the men on Aug. 26 voted to return to work. Rates paid for cleaning up dust in one operation resulted in a strike at four operations of the Berwind-White Coal Mining Co., Windber, Pa., Aug. 18, involving some 1,400 men.

Questions of miner representation figured in at least two cases in August. In one, the National Labor Relations Board ordered an election at the Fentress Coal & Coke Co., Wilder, Tenn. In the other, employees of the Clinchfield Coal Corp., Clinchco, Va., rejected the United Mine Workers of America as their bargaining agent by a vote of 778 to 526. The vote promptly was appealed by District 28, UMWA.

Explosives Instructions Issued; Security Work Under Way

Rigid instructions regarding the storage, handling and transportation of explosives by the more than 145,000 persons licensed under the Federal Explosives Act were issued Aug. 5 by Secretary of the Interior Ickes for the twofold purpose of checking sabotage through the use of explosives and preventing disasters involving explosives, particularly in coal and metal mines and quarries, on construction jobs and in other projects in the war program. The regulations cover all phases of the question of handling, storing and using explosives, and control will be exercised by federal coal mine inspectors and representatives of the Explosives Control, Mineral Production Security and Safety divisions of the U. S. Bureau of Mines.

The Mineral Production Security Division is a newly organized department of the Bureau cooperating in the general Facility Security Program of the United

States Government, heading up in the Facility Security Branch of the Office of Civilian Defense. The division has employed 76 trained engineers to act as its agents and to this personnel has delegated the responsibility of making investigations in and around coal mines and of launching security measures in cooperation with mine managements.

The war-time authorization of this division directs it to concern itself with any factor which could effect continued production, such as personnel safety, labor trouble or decreased efficiency. However, it will concern itself primarily with the safety of the plants themselves, stressing management responsibility in preventing interruptions from such hazards as fire and explosions and in taking precautions against possible subversive actions.

Ship Illinois Coal to Canada On Newsprint Ships

The first cargo of midwestern coal for Canada left Chicago Aug. 10 in the diesel-powered ship "Chicago Tribune." It marked the opening of markets in the Dominion to operators of mines in southern Illinois and western Kentucky. The Tribune's newsprint carrier will deposit its coal cargo at Fort William, Ont., on the upper shore of Lake Superior. It will consist of 4,000 tons of a 150,000-ton contract for the Canadian Pacific Ry.

Soon another Chicago Tribune boat, the "Heron Bay," will pick up a 5,000-ton coal cargo at Chicago. Part of the fleet of six ships owned by the Quebec & Ontario Transportation Co., Tribune company subsidiary, these ships formerly made the trips to upper Lake Superior without cargo. After bringing newsprint paper from Thorold, Ont., they went to Heron Bay to load pulpwood for the paper mills at Thorold.

R. B. Smith, assistant coal traffic manager of the Illinois Central R.R., said the new route will become increasingly important. "It will be used principally in June, July and August, which happen to be the months when southern Illinois mines lack business in normal times," he said. "Right now, they are escaping the seasonal doldrums because of advance buying due to the war."

Bureau of Mines Approvals

Three approvals of permissible equipment were issued by the U. S. Bureau of Mines in July, as follows:

Joy Manufacturing Co.—Type PL11-7P elevating conveyor; 10-hp. motor, 250 and 500 volts, d.c.; Approvals 452 and 452A; July 7.

Jeffrey Manufacturing Co.—Type 61 power unit for conveyors; 5-hp. motor, 200 volts, a.c.; Approval 453; July 9.

Joy Manufacturing Co.—Type 2SC-1D shuttle car (storage battery operated); three 5-hp. motors, 90 volts, d.c.; Approval 454; July 9.

KEEP PRODUCTION UP

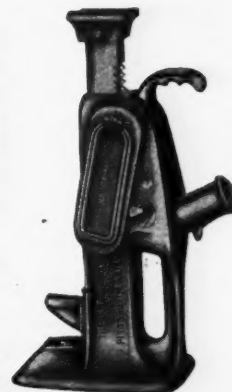


KEEP COSTS DOWN

WITH
DUFF-NORTON JACKS

Handy, dependable, efficient — Duff-Norton Jacks serve modern mining in a score of ways. These are the "mechanical muscles" that relieve human backs of tiring labor, thus conserving strength for greater coal production. They lift timbers, brace roofs, brace cutting machines and perform necessary jobs everywhere from working face to tipple.

Be sure that your jacks are of highest quality by specifying "DUFF-NORTON!"



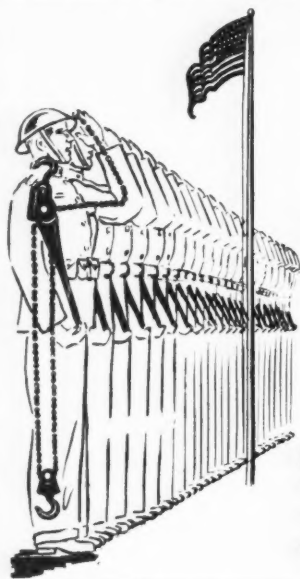
One of the many types and sizes of Duff-Norton Jacks.

"The House That Jacks Built"
THE DUFF-NORTON MANUFACTURING CO.
PITTSBURGH, PENNSYLVANIA

Canadian Plant:
COATICOOK, QUEBEC

Representatives
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Are
on
the
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UNCLE
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Conserve
Your
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HELP
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COFFING HOIST COMPANY
Ratchet Lever, Spur Geared
and Electric Hoists

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VITAL for VICTORY!

HEAT for Homes

POWER for Plants

Anthracite is "PREPARED" FOR THE EMERGENCY



**Wilmot
Engineering
Company,
Hazleton, Pa.**

Efficient preparation in breakers built by Wilmot, and in breakers modernized by the installation of Wilmot Hydrotators, is helping to meet the increased wartime demands for heat and power, so necessary to VICTORY!

WILMOT
A GREAT NAME IN
THE COAL INDUSTRY
HYDROTATOR
COAL Preparation UNITS

Fuel-Oil Situation Continues Critical; Coal and Oil Movement Boosted

(Continued from page 42)

August also brought increased stress on preventing waste as a means of helping the situation. Recommending conversion first, Mr. Ickes on Aug. 16 recommended that oil burners which cannot be converted be cleaned, adjusted and repaired. And whether oil or coal is used, he stated, steps should be taken to insulate homes against heat loss.

A general war on fuel waste, including a "War on Fuel Waste Week" beginning Aug. 17, was declared by the American Society of Heating and Ventilating Engineers at a meeting early in the month. The war service committee of the organization was placed in active charge of the campaign, which includes a fuel users' pledge.

Further steps were taken by WPB in August to assure the availability of conversion equipment. The board on Aug. 10 set aside 11,009 tons of iron and steel to assure manufacture of grates and equipment. Home owners, it was stated, need only place their orders with their dealers. No papers are required. Manufacturers should file for grate iron and steel on Form PD-25F if operating under PRP, or on PD-1A if not. Both home owners and manufacturers were advised that Conservation Order L-41 is not a barrier to construction necessary in conversion, as a supplementary order (L-41-b) had expressly removed restrictions on conversion installations begun before Jan. 1, 1943, in the East-Coast states and Oregon and Washington. Previously (July 29) WPB had ruled that replacement parts for furnaces could be manufactured over and above quotas established by Order L-22. About the same time, further production of oil or gas space heaters for domestic use was cut off, except for government agencies.

Anthracite Spurs Conversion

Anthracite operators were particularly active in advertising and other educational work designed to speed conversion and assure purchases of coal now. Newspaper space was backed up by radio programs in a number of cases. On Aug. 17, Anthracite Industries, Inc., issued a report (No. 3121) on "Suggestions for Conversion From Coal to Oil" prepared by its Primos (Pa.) laboratory. Topics discussed include "How to Recognize Equipment That Can Be Converted," "Heaters Designed for Either Coal or Oil," "Auxiliary Methods of Heating and Fireplaces," "Auxiliary Heating With Service Water Heaters (for Piped Systems Only)," "Thermostatic and Draft Controls" and "Fuel Conservation." On the same day, the organization called attention to a release by the National Better Business Bureau, Inc., warning possible purchasers that conversion installations should be carefully considered, and also pointing out that Anthracite Industries, Inc., is of the opinion that units employing the oil burner fan for forced draft do not offer a sufficiently reliable means of heat liberation with anthracite.

Further steps to increase overland oil flow to the East also characterized August developments. Construction of the 24 in. Texas-Illinois pipeline got under way the first of the month, while measures were taken to increase both rail and inland water movement. Some 5,000 additional tank cars were diverted from western service, which is expected to result in a still further increase in the record movement of 830,820 bbl. daily for the week ended Aug. 15. The expected railroad goal this fall and winter is 1,000,000 bbl. daily, according to latest reports. To further stimulate overland movement, Jesse H. Jones, federal loan administrator, agreed to take care of the extra cost of such movement, as well as the extra cost involved in buying petroleum products in the Middle West compared with purchases on the Gulf coast.

In addition to various pipeline projects other than the Texas-Illinois line, steps were taken to increase the water movement of oil. On Aug. 17, the Office of Defense Transportation assumed war-time emergency control over all domestic waterway craft capable of transporting liquid cargo in bulk, including directing such craft to move oil as directed and converting them for transporting liquid cargo if necessary. Previously (Aug. 1), it was announced that the Defense Plant Corp., in cooperation with the Army Corps of Engineers, ODT, Inland Waterways Corp., and the Smaller War Plants Corp., had agreed to finance conversion and reconstruction to provide additional barge facilities for the movement of oil.

Pressure on coal purchase, movement and storage was no less pronounced in August. As might be expected, movement to the New England and Atlantic Coast states was the subject of the most attention, although the West Coast, the Southwest and the Middle West also were pointed out as critical areas. To help avert a threatened coal and wood shortage in Oregon and Washington, Gen. Brice P. Disque, assistant director, Office of the Solid Fuels Coordinator for War, was dispatched to Seattle early in August. Consumers in Kansas and Missouri were told by Howard A. Gray, Acting Solid Fuels Coordinator, on Aug. 24 that immediate steps must be taken to build up supplies. Previously (Aug. 10) users of middle western coal were advised by Coordinator Ickes that they should take immediate steps to protect supplies for the coming winter. Attempts by Governor Green, of Illinois, to interest the ODT in zoning of shipments of coal, however, were met with a statement by Director Joseph B. Eastman, according to reports, that the Office of Solid Fuels Coordination for War is "against asking any user of coal to take it from a specific mine or district."

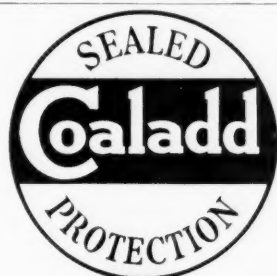
New England was singled out for special pleas to build up coal supplies in August, with Coordinator Ickes also suggesting that

anthracite users accept suitable alternative sizes in case regular sizes should be short. Emergency freight-rate revisions designed to facilitate rail-and-water movement of coal to New England included new tariffs on shipments over the Chesapeake & Ohio, Norfolk & Western and Virginian railways and their connections from the Pocahontas and New River fields to Philadelphia for transshipment outside the Delaware Capes. At the same time, the Virginian published a lower rate on shipments to the Edgewater pier, New York, Susquehanna & Western R.R., and the Hoboken pier of the Delaware, Lackawanna & Western via Roanoke, Va.

Early in August, Price Administrator Henderson issued a temporary schedule of maximum rates for barge shipments of coal to New York and New England and simultaneously adjusted existing machinery to enable the Federal Government to absorb any resulting increase in shipping charges. Numerous other adjustments were made in ceiling prices to preserve or increase the movement of coal into certain consuming areas.

New Operation Starts Shipping

Shipments of coal are reported to have been started from the new operation of the Robinson-Combs Coal Co., Dorton, Ky., on the Chesapeake & Ohio Ry. J. H. Combs is manager of operations. The company will develop a tract of several hundred acres of the Elkhorn seam.



DUSTLESS COAL

Don't confuse "Coaladd" with ordinary chemical treatment! It is different! It wraps coal in a film! It is harmless to metals and rubber belting. It answers every requirement of the producer, retailer and user.

THE JOHNSON-MARCH CORP.
52 VANDERBILT AVE. NEW YORK

American AUTOMATIC Door

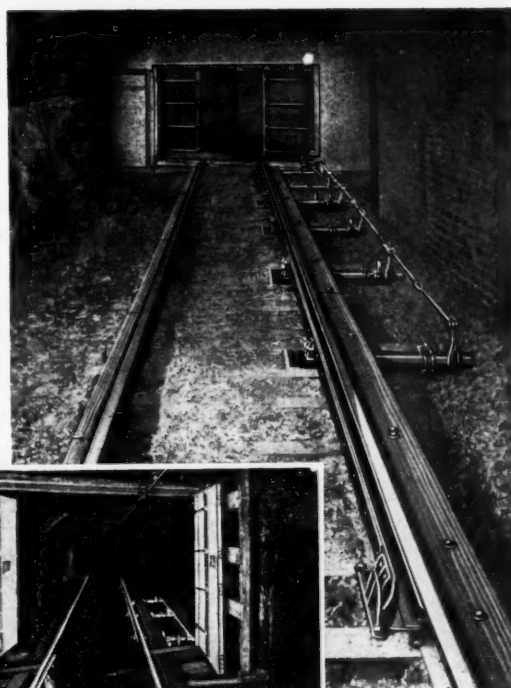
Maintains mine air flow to minimize explosion dangers, requires no Attendant, pays for itself—quickly—saves labor, speeds trips. Operates mechanically, safe way—

OPENS

... Split-second

CLOSES

... One second



The American Automatic Mine Door may be purchased outright, leased or paid for as trappers wages. Write for complete catalogue, and ask us to make study of your mine. No cost.

American Mine Door Co.
2057 Dueber Ave. Canton, Ohio

Pittsburgh Coordinator Sought To Halt River Coal Slump

Appointment soon of a river coordinator for the Pittsburgh (Pa.) district it is hoped will alleviate the river coal shipping situation there. River operators there say coal cargoes have diminished and assert that the slump is seasonal or that mine production has dropped, but coal operators report neither reason sufficient to be noticeable in river shipping.

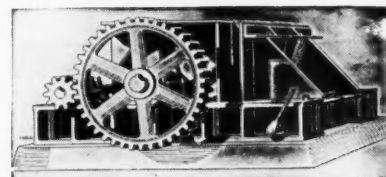
Observation shows about 50 coal and steel barges have been tied up, idle; and some of the largest boats on the rivers have been moored fast more than two weeks at Pittsburgh.

Moffat Leases Storrs Colliery

Storrs colliery of the Glen Alden Coal Co., Scranton, Pa., has been leased to the Moffat Coal Co. for 15 years from Aug. 1. Earl W. Lamb, a former executive of the Penn Anthracite Collieries Co., has been named general superintendent of the operation.

The terms of the lease convey the Storrs mine and breaker to the Moffat organization, according to W. W. Inglis, president of Glen Alden. The operation has 30 to 40 million tons of unmined coal in its seams. The breaker, constructed about 20 years ago, handled about two million tons a year at peak capacity and the operation employed about two thousand men. It was closed a decade ago.

A NEW VERSION OF AN OLD TYPE



"PENNSYLVANIA" TYPE "K" SINGLE ROLL COAL CRUSHER

With this advanced design, in rugged STEELBUILT construction, far more accurate sizing is possible to meet Code requirements through quick adjustability, in a range from $\frac{3}{4}$ " to 8".

Further—real protection is provided by improved Safety Toggle Equipment, which quickly passes Tramp Iron, and instantly returns Breakerplate to crushing position.

Seven (7) sizes afford a capacity range from 50 to 1000 tons per hour.

Send for Bulletin No. 2006.

Also,—"PENNSYLVANIA"
BRADFORD BREAKERS, BRADMILLS,
GRANULATORS, HAMMERMILLS
PUT YOUR COAL PREPARATION PROBLEMS
UP TO US.



Liberty Trust Bldg. Philadelphia
Representatives in Principal Centers.

New American Coal Co. Begins Production

The recently organized American Coal Co., Knoxville, Tenn., began producing 50 to 60 tons per day, in three grades, for wagons and trucks Aug. 1. R. P. Everence is president, general manager and engineer; F. J. Moses Jr., vice president; Vance Earley, secretary, and O. J. Moody, treasurer.

Leases and options cover 300 acres including five seams. The Bear Waller is now being worked. Some 700 ft. of railroad and a tippie are planned with a daily capacity of 2,000 tons. The mine will be

equipped, Mr. Everence reports, with an entirely new conveyor system of cable design for which patents have been applied for. No track or engines will be employed. The new tippie will be equipped with rotary screens for the production of four grades. The opening makes it possible to reach a large additional coal acreage in the future.

Full production is planned, according to company plans, by Nov. 1, providing war necessities do not interfere. No scrip will be issued, and a commissary will be provided, with baths and all other modern conveniences for the miners. The operation will be completely electrified.

West Virginia to Dedicate Mineral Industries Building

With the opening of its 76th academic year, West Virginia University, Morgantown, W. Va., on Oct. 16 and 17 will dedicate its new million-dollar Mineral Industries Building. Dr. Friend E. Clark, chairman of the university graduate council and head of the department of chemistry, who is chairman of the dedication committee, announces that the speakers will include Governor M. M. Neely and Charles E. Lawall, president of the university.

Begun in 1940, after years of careful planning, the six-story building houses the School of Mines, the West Virginia Geological Survey, and the department of chemical, metallurgical, and ceramic engineering. In the basement is a complete model coal mine for the study of ventilation. Several hundred feet of airways are provided, and a two-stage axial-flow fan with adjustable propeller blades provides an air current of 30,000 cu.ft. of air per minute. Part of this as well as the ground floor, plus a large two-story laboratory at the south end of the building, are taken up with the School of Mines' administrative offices, laboratories and lecture rooms. The laboratories, furnished for research and for class instruction, are equipped for the various divisions of the mining and oil and gas industries.

In the coal-preparation laboratory the coal is handled by standard conveying, crushing and elevating equipment. Coal-cleaning machines installed include a Baum type automatic coal washer, a cone cleaning unit, a heavy liquid coal washer, a Simplex jig, two types of concentrating tables, and numerous smaller testing units. A sample-preparation room is equipped with the latest devices for mechanically screening and preparing samples for analysis. Fully equipped for its task, the coal-analysis laboratory contains separate balance, furnace and calorimeter rooms.

Transportation Rules Revised For Improved Service

To promote the movement of coal and other products, several orders were issued regarding loading, handling of cars and other phases of transportation in August. Developments got under way with a request from Joseph B. Eastman, Director of Defense Transportation, that shippers order gondola cars or other types of equipment for the shipment of various bulk materials not requiring the use of hopper cars, thus releasing the latter type of equipment for such services as moving coal.

Early in the month, the Association of American Railroads announced that the "75-percent rule" would be placed in effect immediately. This rule works on the same basis as the "100-percent rule." As an example, according to the National Coal Association, if a mine rated at 100 cars was holding 74 cars at the close of the business day, it would receive 100 cars the next working day. But if it were holding 75 or more cars, it would receive no further cars until the no-bills were reduced to less than 75.

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ENGINEERS AND BUILDERS OF
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Authoritative Valuations and Reports of
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GEOLOGIST AND MINING ENGINEERS
Specialist in examination and valuation of bitu-
minous coal properties; Investigations of operating
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Private records covering 40 years of professional
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Coal plant design, construction, supervision and
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Designing Engineers—Consultants—Builders

Practical Application of Skilled
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The long-awaited heavy-loading order (General Order O.D.T. No. 18) was released Aug. 14 to take effect Sept. 15. The intent of the order is to bring about better utilization of equipment, particularly box and refrigerator cars, and to conserve much-needed motive power, through heavier loading. In brief, the order provides that "No rail carrier shall accept for transportation or forwarding, or forward, any freight car containing freight which is not loaded to required capacity."

Promotion of waterway transportation was the objective in several new appointments by ODT. Formation of a New England Regional Advisory Committee on Coal was announced early in the month. This committee, serving in an advisory capacity to the Division of Coastwise and Intercoastal Transport, is composed of Edward L. Bowditch, Coastwise Transport Corporation; Kingsbury Browne, H. N. Hartwell & Son; O. L. Alexander, Pocahontas Steamship Co.; Edward Page, New England Coal & Coke Co.; Nelson C. Smith, Wilmore Steamship Co.; and Maxwell Harris. To insure better coordination and a more efficient use of domestic waterway facilities, Ernst Holzborn, formerly director of the Division of Coastwise and Intercoastal Transport, was named an assistant director of ODT in charge of all waterway transportation. Mr. Holzborn

was succeeded in his former position by Charles F. Kellers.

In the field of highway transport, Price Administrator Leon Henderson announced reduced quotas for tires in September, and called upon all vehicle operators to intensify tire-conservation efforts to make the available supplies do the job.

Coal-Mine Accident Fatality Rate Shows Slight Decline

Accidents at coal mines of the United States caused the deaths of 107 bituminous and 20 anthracite miners in June last, according to reports furnished the U. S. Bureau of Mines by State mine inspectors.

With a production of 48,410,000 net tons, the accident death rate among bituminous miners was 2.21 per million tons mined, compared with 2.27 in June, 1941.

The anthracite fatality rate from accidents in June last was 3.90, based on an output of 5,133,000 net tons, against 4.09 in the sixth month of 1941.

For the two industries combined, the accident fatality rate in June last was 2.37, compared with 2.45 in the corresponding month of last year.

Fatalities during June last, by causes and states, as well as comparable rates for the first half of 1941 and 1942, are:

DEATHS AND FATALITY RATES AT UNITED STATES COAL MINES, BY CAUSES OF ACCIDENTS*

January-June, 1941 and 1942

Cause	Bituminous				Anthracite				Total			
	Number Killed		Killed per Million Tons		Number Killed		Killed per Million Tons		Number Killed		Killed per Million Tons	
	1941	1942	1941	1942	1941	1942	1941	1942	1941	1942	1941	1942
Underground:												
Falls of roof and coal...	259	287	1.149	1.005	54	76	2.081	2.575	313	363	1.245	1.153
Haulage...	86	104	.382	.364	14	18	.539	.610	100	122	.398	.387
Gas or dust explosions:												
Local...	12	5	.053	.017	5	4	.193	.135	17	9	.067	.028
Major...	32	101	.142	.354					32	101	.127	.321
Explosives...	10	11	.044	.039	5	5	.193	.169	15	16	.060	.051
Electricity...	11	19	.049	.067	2	3	.077	.102	13	22	.052	.070
Machinery...	16	18	.071	.063					16	18	.064	.057
Shaft...	2	3	.009	.010	2	2	.077	.068	4	5	.016	.016
Miscellaneous...	3	17	.013	.060	7	7	.270	.237	10	24	.040	.076
Stripping or open-cut...	13	11	.058	.039	2	1	.077	.034	15	12	.060	.038
Surface...	18	20	.080	.070	7	5	.270	.169	25	25	.099	.079
Grand total...	462	596	2.050	2.088	98	121	3.777	4.099	560	717	2.228	2.276

* All figures subject to revision.

UNITED STATES COAL-MINE FATALITIES IN JUNE, 1942, BY CAUSES AND STATES

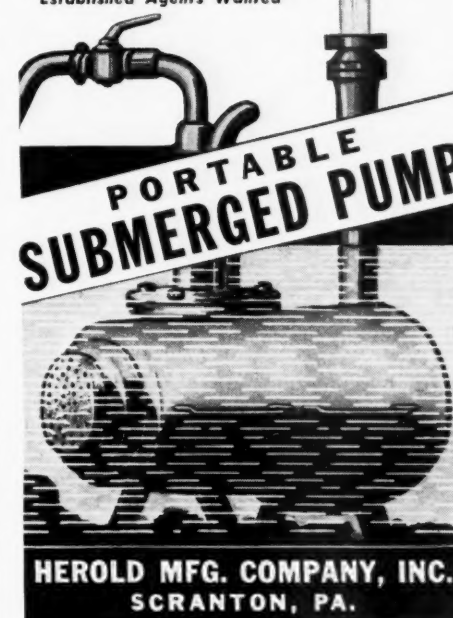
State	Underground										Open-Cut	Surface	Grand Total
	Falls of Roof	Falls of Face	Haulage	Gas or Dust Explosions	Explosives	Electricity	Machinery	Other Causes	Total Underground				
Alabama	3	..	1	..	2	4	1	1	12	..	..	12	
Arkansas	1	..	..	..	..	..	..	..	1	..	..	1	
Colorado	1	..	1	..	..	..	..	..	2	..	..	2	
Illinois	5	1	1	..	..	..	..	..	7	1	..	8	
Indiana	..	..	1	..	..	1	..	..	2	..	..	2	
Iowa	..	..	1	..	..	1	..	..	2	..	..	2	
Kentucky	8	..	3	..	..	..	..	1	12	..	..	12	
Ohio	6	..	..	..	..	..	2	..	8	..	..	8	
Oklahoma	..	..	..	4	..	..	..	..	4	..	..	4	
Pennsylvania (bituminous)	14	..	2	..	..	..	..	..	16	..	2	18	
Tennessee	2	..	..	..	..	..	1	1	4	..	..	4	
Utah	1	..	..	..	..	..	..	1	2	..	..	2	
Virginia	3	..	2	..	..	1	..	..	6	..	..	6	
Washington	1	..	..	..	..	..	..	..	1	..	..	1	
West Virginia	17	2	5	..	..	..	..	1	25	..	..	25	
Total bituminous	62	3	17	4	2	7	4	5	104	1	2	107	
Pennsylvania (anthracite)	15	..	5	20	20	
Grand total	77	3	22	4	2	7	4	5	124	1	2	127	

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Portable Submerged Pumps are patented and fully automatic with these performance features:

- Horizontal drum minimizing cost to excavate sump, no rotating parts, long life.
- No lubrication, low air consumption, not easily affected by abrasive material such as mud, silt, etc.
- High lift capacity. Write for data today.

Established Agents Wanted



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SCRANTON, PA.



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• SAFETY
• EFFICIENCY
• ECONOMY

1. Portable's Bulb contains two major filaments. If one burns out, a simple turn of a switch cuts in second filament.
2. Headpiece is adjustable so that wearer can focus direction of light beam without tilting his hat to unsafe angles.
3. Lead Acid type battery gives steady, brilliant light throughout shift. Five plates per cell assure proper light with ample reserve capacity. Battery efficiency is GUARANTEED never to drop below 80% of rated efficiency.
4. Portable's Contract carries service clauses which are most inclusive ever known to the industry.

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Cool Caps and Hats Electric Cap Lamps Safety Lamps
Safety Shoes Goggles Respirators

2,700,000 Tons in 3½ Years Without Fatal Accident

Ronco mine of the H. C. Frick Coke Co., Ronco, Pa., has won commendation by Dr. R. R. Sayers, Director, U. S. Bureau of Mines, for an outstanding safety achievement. In 3½ years it has produced 2,700,000 tons of coal without a fatal accident.

Training of Utah Foremen Begun Under Manpower Commission

With higher production as the goal, the Training Within Industry section of the War Manpower Commission inaugurated a foremen's training program in the Carbon County coal field of Utah in August. The program is based on establishment of an institute for representatives of the participating mines. These representatives in turn are expected to pass on their knowledge to other foremen at their respective operations, who in turn will relay it to the mine employees, the object being an overall increase in efficiency.

Coal companies participating in the program were reported to be: Columbia Steel Co., Hi-Heat Coal Co., Independent Coal & Coke Co., Liberty Fuel Co., Peerless Sales Co., Spring Canyon Coal Co., United States Fuel Co., Utah Fuel Co. and the Lion Coal Corp.

New Preparation Facilities

CRUCIBLE FUEL CO., Crucible, Pa.—Contract closed with Roberts & Schaefer Co. for complete tippie and preparation plant; equipment will include dumping facilities (revolving dump, car feeder, etc.) with a capacity of 500 t.p.h. of mine-run; belt conveyor to picking and crushing facilities over a 2,000-ton reinforced concrete storage bin for blending coals from mine; belt conveyor to cleaning plant of concrete construction, using RandS hydro-separators and Hydrotator to wash 0x4-in. coal at rate of 400 t.p.h.; and with complete dewatering and water-settling facilities and centrifugal dryers; also river and rail facilities for all cleaned coal at rate of 500 t.p.h.; to be completed about Dec. 1.

GULF MINING CO., Crab Orchard, W. Va.—Contract closed with Kanawha Mfg. Co. for Allis Chalmers Aero-vibe screen to handle 50 t.p.h. of nut and pea coal, together with conveying equipment.

SEMIET-SOLVAY CO., Harewood, W. Va.—Contract closed with Kanawha Mfg. Co. for 36x48-in. Flex-tooth crusher to handle 500 t.p.h. of 0x5-in. coal, reducing it to 0x1½-in.; includes chutes, hoppers and supporting steel structure.

SUPREME ANTHRACITE COAL MINING CO., Ontario Breaker, Peckville, Pa.—Contract closed with Finch Mfg. Co. for one 4-ft. Menzies cone to clean rice coal; capacity, 22 tons per hour.

TENNESSEE COAL, IRON & RAILROAD CO., Birmingham, Ala.—Contract closed with Jeffrey Mfg. Co. for two 3-compartment 6-ft. 6-cell Baum jigs, capacity 150 t.p.h. of 0x3-in. raw coal; also one 2-com-

partment diaphragm jig, capacity 75 t.p.h. of 0x¾-in. raw coal.

WEST VIRGINIA COAL & COKE CORPORATION, No. 5 Mine, Omar, W. Va.—Contract closed with Kanawha Mfg. Co. for Kanawha power rotary dump with dump shield and hopper, Kanawha heavy-duty trip feeder and supporting steel work.

Ontario Lignite Deposits To Be Developed

The Ontario Government has planned to proceed immediately with development of lignite deposits in the Onakawana region 175 miles north of Cochrane on the Temiskaming & Northern Ontario Ry., it was announced on Aug. 11 by Premier Mitchell F. Hepburn of Ontario. The announcement followed an inspection trip to the field by the Premier and members of his Cabinet.

The Onakawana lignite supply, according to Mr. Hepburn, is almost unlimited, with 100,000,000 tons already being blocked out and 8,500,000 tons readily accessible. Tests are said to have demonstrated that the lignite has good burning qualities. The decision to proceed with the development involves replacement of plans announced some months ago for a minor development and pilot plant for processing to raise heat content and reduce bulk with new plans calling for work to cost \$250,000 and provision for a \$1,000,000 development if circumstances warrant.

A separate branch of the government will be set up to handle the lignite development and it will be responsible for pushing the project as rapidly as equipment can be obtained.

Coal-Treating Questions Occupy Operators

Search for satisfactory means of dust-proofing coal continued to engross operators in August as a result of the limitation order prohibiting the use of petroleum products in coal treating. Protests by producers and consumers have as yet apparently not moved the War Production Board from its original position.

While investigation of alternative treating products was pressed, the suggestion also was made that coal itself be processed to produce a satisfactory dustproofing medium. Calcium chloride was the subject of a bulletin entitled "The Dustless Treatment of Coals With Materials Other Than Oil," issued by the Battelle Memorial Institute. This organization pointed out that work on the problem is continuing but that the effectiveness of calcium chloride is dependent upon the dryness of the atmosphere and the inherent moisture of the coal. "Coals having inherent or bad moisture contents of over 8 percent" cannot "be effectively dustproofed with calcium chloride because such coals are porous and will absorb the treating material," hence removing it from the surface of the coal.

Among those organizations investigating new products has been the Utah Fuel Co., with mines in Carbon County, Utah. In

the July issue of its magazine, *Coal*, the company reports on experiments with "Coaladd," pronouncing it entirely satisfactory from the standpoint of dustproofing qualities. Use of "Coaladd" instead of oil started June 8, the change requiring installation of a few new parts in the spraying system. In addition to stating that the product is less corrosive on steel than plain water, has less adverse effect on rubber and fabric than oil, retards degradation due to oxidation in storage and renders the coal less subject to spontaneous combustion, *Coal* also points out that "it protects against freezing, retards segregation of fines, decreases fly ash, is colorless and odorless, brightens coal, is clean as flint and yet does not change the coal's combustion factors or chemical characteristics."

Production Drive Headquarters Outlines Services Available

Pointing out that in the first six months of its existence some 3,500,000 men have enlisted in the war-production drive in the 1,400 plants which have established joint management-labor production committees, War Production Drive Headquarters, Office of War Information, Washington, D. C., recently urged expansion of the movement and outlined the services available to such committees. These committees are voluntary and make their own rules, although headquarters stands ready to assist with general suggestions and specific material of an educational nature.

Included in the material and helps available are a series of striking posters; streamers; information stand service; motion-picture service; records and transcriptions; placards for bulletin boards; stickers; material for plant newspapers; bulletin service for committees; production and merit awards; and planning assistance as necessary.

Lackawanna Teams Lead

Three Hudson Coal Co. first-aid teams from Lackawanna County, Pennsylvania, qualified on Aug. 23 to participate in the State-wide first-aid meet to be held in Kingston on Sept. 19 when they vanquished five teams of the same company from Luzerne County in preliminary competition. The victorious teams are: first, Gravity Slope; second, Eddy Creek; third, Coalbrook.

Obituary

SAMUEL J. PHILLIPS, 70, a State mine inspector in Pennsylvania for the last 32 years and well known in the anthracite region, died suddenly Aug. 4 of a heart attack at his home in West Scranton.

GEORGE P. GALLAGHER, 65, a mine superintendent for the Lehigh Valley Coal Co., Wilkes-Barre, Pa., died Aug. 19 at his home in Kingston, Pa. He had been with the company for 43 years.

WILLIAM M. HENDERSON, 73, president of the Henderson Coal Co., which had a mine at Hendersonville, Pa., now operated by the Pittsburgh Coal Co., died Aug. 11 in Pittsburgh.



A. C. Dittrick

Personal Notes

ROBERT J. BLAIR, formerly resident engineer with the Cane Creek Mining Co., Bankhead, Ala., and affiliated interests, has been appointed assistant to the general superintendent of mines of the DeBardelben Coal Corporation, Sipsey, Ala.

MARTIN D. COLLIER, with the Consolidation Coal Co. for a number of years in various capacities, has been made superintendent of the company's Nos. 204 and 206 mines, Jenkins, Ky. Mr. Collier succeeds Raymond C. Denny, now general superintendent for the West Virginia Coal & Coke Co., Omar, W. Va.

SAM CORTIS has been appointed inspector for the eleventh bituminous district of Pennsylvania, with headquarters at Greensburg, Pa.

RAYMOND G. DENNY, superintendent, Mines 204, 206 and 207 of the Consolidation Coal Co., Jenkins, Ky., for many years, left Jenkins on Aug. 4 to become general superintendent of the West Virginia Coal & Coke Corporation, Omar, W. Va. He began as a water boy with Consol.

A. C. DITTRICK has joined the Warner Collieries Co., St. Clairsville, Ohio, as assistant general manager of mines.

J. L. DOLLAR, formerly mine superintendent at the Montevallo mine of the Montevallo Coal Mining Co., Aldrich, Ala., has been appointed mine foreman at Bankhead No. 1 mine of the Cane Creek Mining Co., Bankhead, Ala. Montevallo mine has been permanently closed.

J. H. EDWARDS, associate editor of *Coal Age*, has been reappointed a member of the Committee on Industrial Power Applications of the American Institute of Electrical Engineers.

J. W. GARVEY, formerly general manager of operations, Maryland New River Coal Co., has been named vice-president in charge of operations. He will continue to have headquarters at Winona, W. Va.

I. S. GILLESPIE, formerly connected

with the Woodward Iron Co., Woodward, Ala., has been made resident engineer for the Cane Creek Mining Co. and affiliated companies, Bankhead, Ala.

J. M. JOHNSTON, assistant general manager, has been made vice-president in charge of operations of the Bell & Zoller Coal & Mining Co., Zeigler, Ill., vice W. P. Young, promoted.

L. E. KELLEY, for many years engineer for the Consolidation Coal Co., Jenkins, Ky., has accepted the position of chief engineer for the Red Jacket Coal Co., Red Jacket, W. Va.

WILLIAM K. LAMBIE, formerly general manager for the Gigliardi coal interests, has been made superintendent of the Somers mine of the Pittsburgh Coal Co., Pricedale, Pa.

H. F. McDONALD has been elected president of the Centralia Coal Co., Centralia, Ill., vice G. Donald Cowin, deceased.

FLOYD MERCER, general manager, Elkhorn Junior Coal Co., Millstone, Ky., for ten years or more, has moved to Hot Spot, Ky., where he has been made general manager of the Hot Spot Coal Co.

C. C. MORFIT was appointed a vice-president of the Pennsylvania Coal & Coke Corporation on Aug. 20. He will be in charge of operations with headquarters at Cresson, Pa. He has been at various times operating executive of a number of large companies in the United States and Canada. For the last several years he has been engaged in consulting engineering practice with offices in New York City.

CLARENCE L. PAYNE, a cutting-machine operator, has been promoted to Joy foreman at Zeigler No. 2 mine, Bell & Zoller Coal & Mining Co., Zeigler, Ill.

A. J. RUFFINI, Cadiz, Ohio, has been elected vice-president in charge of operations of the North American Coal Corporation, Cleveland, Ohio, which controls the Powhatan Mining Co., operating in Ohio; Red Parrot Coal Co. and C. H. Mead Coal Co., both operating in West Virginia. Starting his career in the personnel department of the Goodyear Tire & Rubber Co., he was transferred to the company's coal mining division, the Wheeling Township Coal Mining Co., Adena, Ohio, where he was general superintendent for 15 years. FRANK E. WHITAKER, Sheboygan, Wis., has been elected vice-president and sales manager. He has been connected in a sales capacity with the Pittsburgh Coal Co., Consolidation Coal Co. and, more recently, was assistant general sales manager of the C. A. Reiss Coal Co.

FRANK M. STEPHENS JR. has been named a research engineer on the technical staff of Battelle Memorial Institute, Columbus, Ohio, and has been assigned to the materials beneficiation division. He is a recent graduate of the Colorado School of Mines.

ROBERT WEIR, Zeigler, Ill., has been appointed assistant director of the State Department of Mines and Minerals of Illinois, succeeding JOSEPH MARCHESI, who



A. J. Ruffini

resigned. Lately mine inspector for the 10th district, Mr. Weir previously served in various capacities with the Bell & Zoller Coal & Mining Co. JAMES R. WILSON, West Frankfort, succeeds Mr. Weir as inspector in the 10th district.

ELMOS WILLIAMS, Joy foreman at Zeigler No. 2 mine of the Bell & Zoller Coal & Mining Co., Zeigler, Ill., has been advanced to section foreman.

Safety Campaign Under Way

The campaign of the National Safety Council to conserve manpower by reducing accidents, to be defrayed by industry contributions of \$5,000,000 (*August Coal Age*, p. 48), got under way Aug. 25 with the voting of \$250,000 for beginning the work by the council trustees, meeting in New York. This initial appropriation will be devoted to starting new work in industrial safety, checking "off-the-job" accidents, assisting local safety councils, promoting traffic safety and reducing accidents in agriculture.

Coal-mining representatives on the committee in charge of the fund drive include Charles E. Dunlap, president, Berwind-White Coal Mining Co.; John J. Tierney, chairman of the board, Koppers company; and Heath S. Clark, president, Rochester & Pittsburgh Coal Co.

Mark Potter Is Dead

Mark Winslow Potter, 76, president of the Pennsylvania Coal & Coke Corporation, noted corporation lawyer and former member of the Interstate Commerce Commission, died Aug. 12 of a heart attack in his office in New York City. He was appointed to the I.C.C. by President Wilson, serving from 1921 to 1925. Two months after his retirement from the Commission he was appointed receiver for the Chicago, Milwaukee & St. Paul Ry., holding that post until March 1, 1928. Later he headed the Carolina, Clinchfield & Ohio Ry., the Clinchfield Coal Corporation, and the Cumberland Corporation. In his legal practice he specialized in rail and coal matters.

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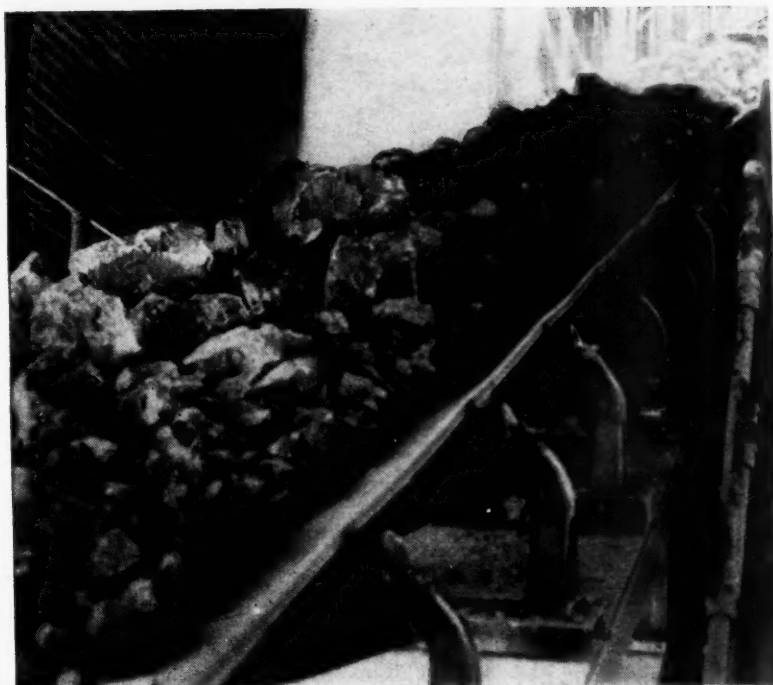
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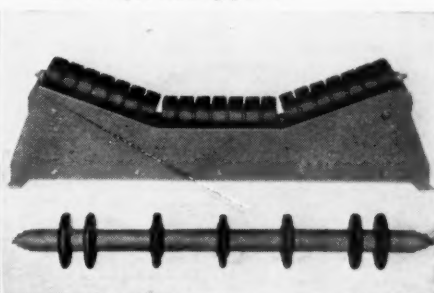
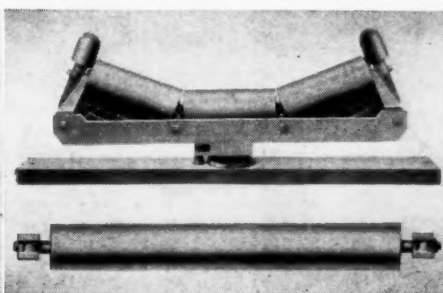
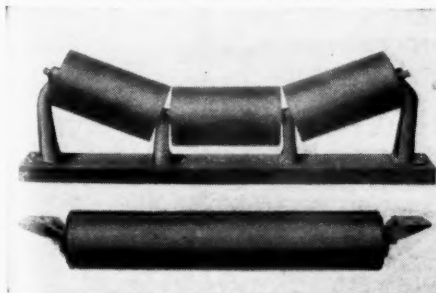
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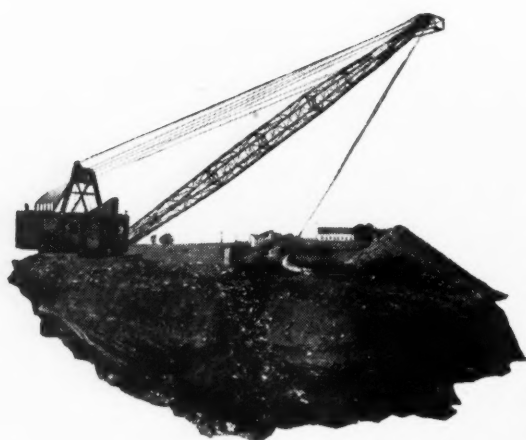
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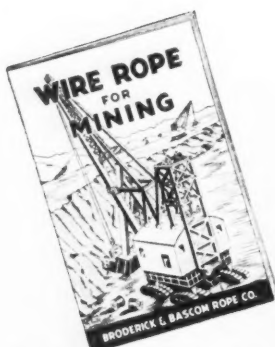
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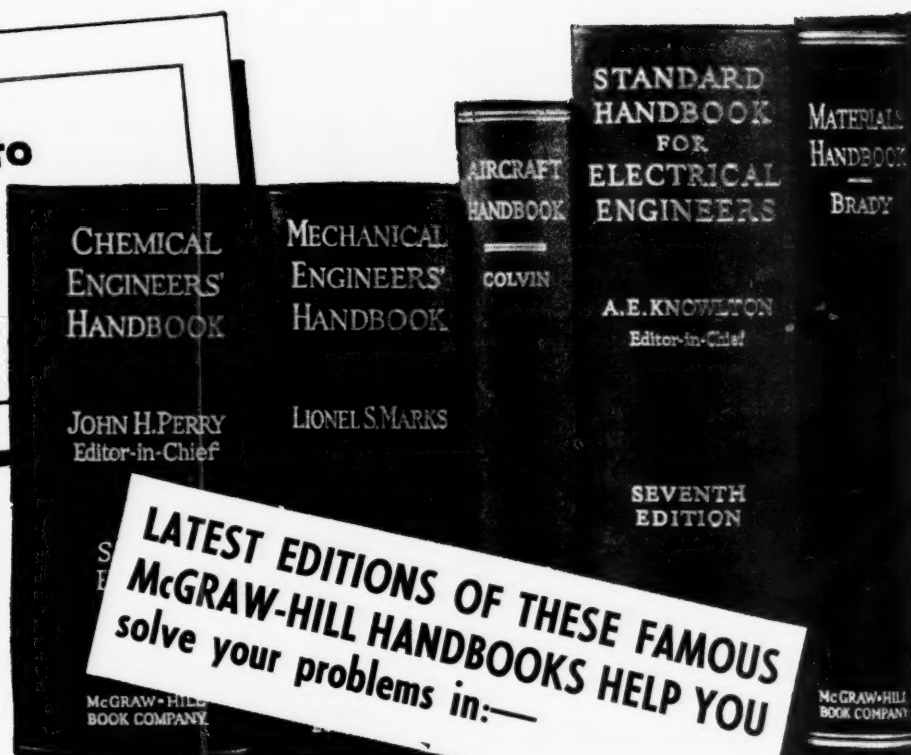


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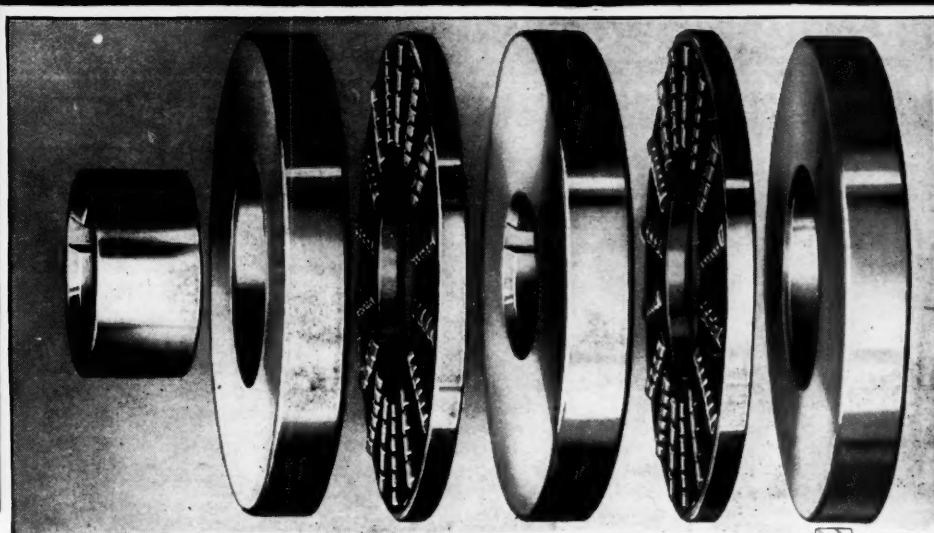
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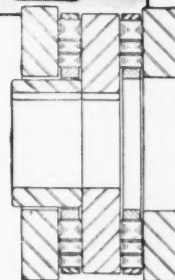
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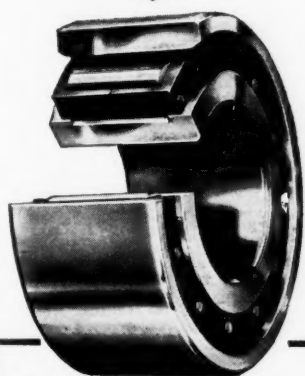


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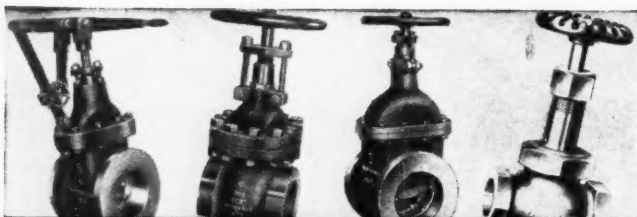
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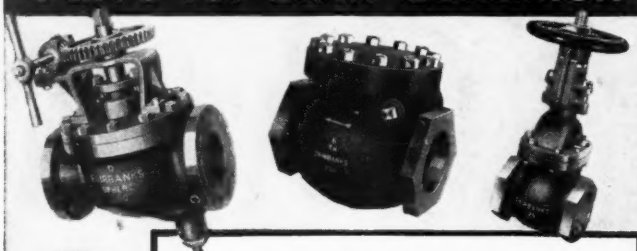
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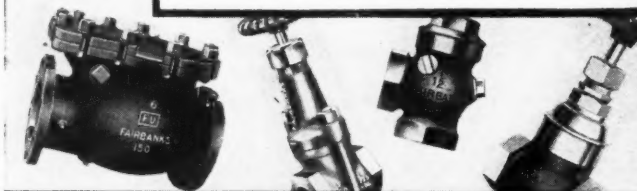
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What is meant by splitting the air current and what are the advantages derived from such methods?

Can a miner live in air in which the oxygen content is reduced to 17 per cent?

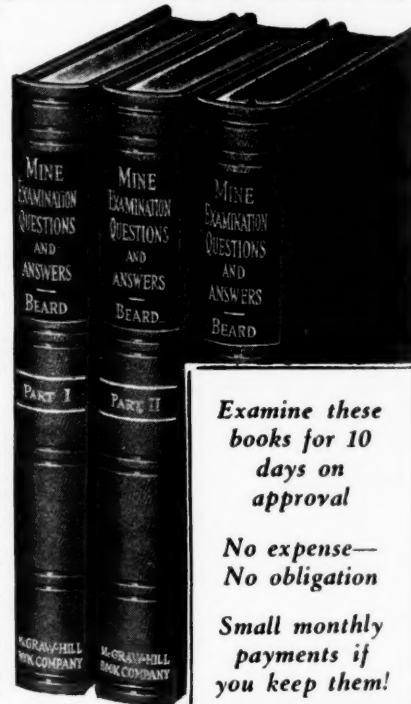
Name five duties imposed on mine foremen by law?

In what time can an engine of 40 effective hp. pump 4,000 cu. ft. of water from a shaft 360 feet deep?

What are the advantages and disadvantages of a gasoline pump, an air pump and an electrical pump?

What is the estimated tonnage per acre, per foot of thickness, for bituminous coal?

These are but a few of the more than 2000 questions given in Beard's books together with full correct answers. Hundreds of men have used this method to prepare for higher, better jobs. You can too, if you have the Beard books and plan to use them systematically. They are the best investment that a mining man can make—not only as an aid for passing examinations but as practical reference volumes on everyday mining operation problems.



Examine these
books for 10
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approval

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McGraw-Hill Book Co., Inc., 330 West 42nd Street, New York

Send me, charges prepaid, Beard's Mine Examination Questions and Answers, 3 volumes, for 10 days' examination. If satisfactory I will pay \$7.50 at the rate of \$1.50 in ten days and \$2.00 per month. If not wanted I will return the three volumes postpaid.

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Address

City and State

Company

Position C. 9-42



A stitch in time!

Typical repairs and patches made with Flexco HD Rip Plates.

THOUSANDS of men in industrial plants, mines and mills all over the country are doing just what this man is doing. They are cutting costs by repairing conveyor belts with Flexco HD Rip Plates.

WRITE TODAY FOR BULLETIN F-100 that shows how easy it is to repair rips, to strengthen soft spots and to put in patches by using Flexco HD rip plates. The bulletin also shows how to make tight butt joints in both conveyor and elevator belts with Flexco HD Belt Fasteners. These fasteners are made in six sizes. Furnished in special analysis steel for general use and in various alloys to meet special conditions.

FLEXIBLE STEEL LACING CO.
4635 Lexington St., Chicago, Ill.

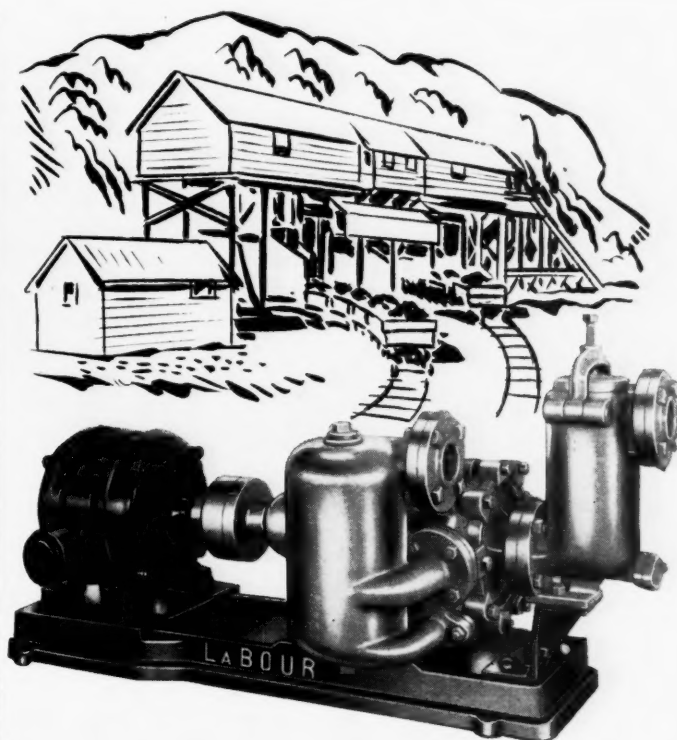


Flexco HD Rip Plate



Flexco HD Belt Fastener

FLEXCO HD BELT FASTENERS
Sole by supply houses everywhere



ECONOMY in Mine Dewatering

Since dewatering costs often constitute a substantial part of mine operating expense, economies in pump upkeep and power requirements are an important management objective.

LaBour Pumps demand little maintenance outlay. That is not a mere claim — it is a well-established fact, based on actual records in scores of mines. The reason, of course, is LaBour simplicity. With but one moving part, mechanical difficulties are held to the absolute minimum.

The same operating records testify to LaBour economy of operation. Power costs per ton of water are low because LaBour Pumps prime quickly and avoid all wasteful recirculation.

If you are looking for lower dewatering costs, consult LaBour.

LABOUR



PUMPS

THE LABOUR COMPANY, Inc., Elkhart, Ind., U. S. A.



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Carbondale 1600

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PERFORATED PLATE

Round—Square—Diagonal—Slot
Any perforation

HENDRICK MANUFACTURING CO.

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Sales Offices in Principal Cities.
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It takes Man-Power to make modern organization and equipment effective. The Man-Power of the industry served by COAL AGE is the experienced personnel included among the 12,000 subscribers of this paper. If your organization needs MAN-power, you can locate the best man, or men, available through a Position Vacant Advertisement in the SEARCHLIGHT SECTION of COAL AGE.

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Wyckoff Wood Pipe has an 87 year record of perfect resistance to the corrosive action of sulphurous mine water. It is an ideal, long-time investment—light, easy to lay, and relatively low in first cost

We also manufacture a special Hard Maple Pipe for flushing culm in the Anthracite Region and wood covering for underground steam lines.

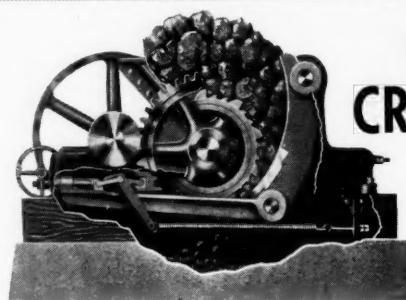
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1855



A. WYCKOFF & SON CO.
Office and Factory
No. 35 Home Street, Elmira, N. Y.
The Originators of Machine Made Wood Pipe

**PERFORATED METAL
COAL MINING SCREENS**
Manufactured exactly to your specifications
Any size or style screen, in thickness of steel wanted with any size perforation desired.
We can promptly duplicate your present screens at lowest prices.

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CHICAGO, ILLINOIS
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We build a type and size for every coal crushing requirement. 100 years of experience is your assurance that we know how. Quotations on request.

McLANAHAN & STONE CORP
Established 1835 HOLIDAYSBURG, PENNA.

What

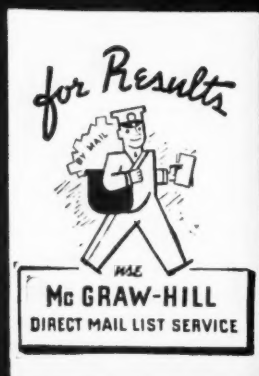
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New York, N. Y.

LIMA TYPE 1201 OWNED BY THE MARSHALL MINING CO., YOUNGSTOWN, OHIO. THE SHOVEL IS EQUIPPED WITH A 42' BOOM, 32' DIPPER HANDLE AND A 2½ YARD DIPPER.



LIMA'S DEPENDABLE PERFORMANCE HELPS TO INCREASE OUTPUT

LIMA shovels and draglines serving the coal mining industry are providing the long, dependable and efficient service so desirable in well operated and successful open-pit mines. The features that make LIMA shovels and draglines so satisfactory and profitable include . . . Helical Cut Gears for quiet, smooth operation . . . Anti-friction Bearings at every important bearing point for greater power and efficiency . . . Large Diameter Drums for longest possible cable life . . . Independent Clutches which make it possible to hoist, swing, travel and boom up or down simultaneously . . . Fast, Mobile Crawlers which make difficult traveling easy. These features and many more mean fewer delays, steadier production and greater dollar value.

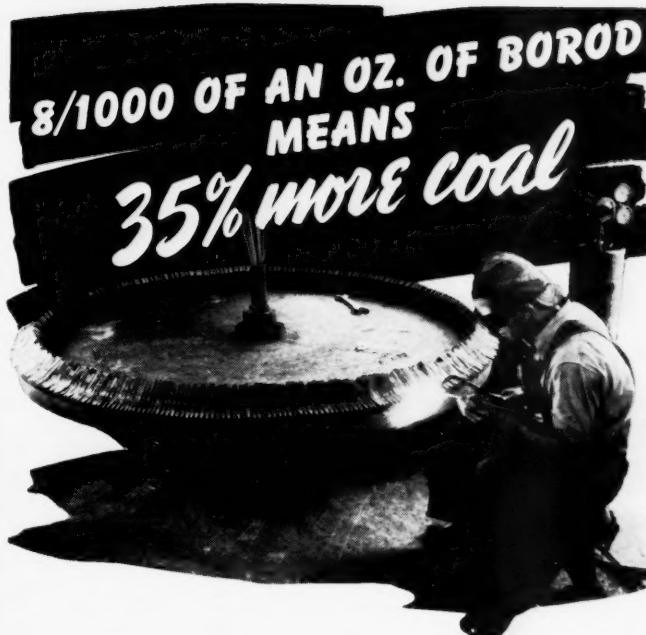
LIMA LOCOMOTIVE WORKS
INCORPORATED

Shovel and Crane Division

LIMA, OHIO

LIMA

COAL AGE • September, 1942



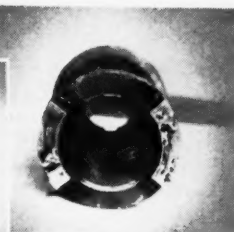
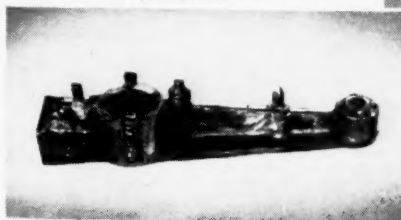
You wouldn't think 8 1,000 of an ounce of metal would make much difference one way or another in the performance of an Undercutter Bit, and usually it wouldn't, but when that metal is Borod it makes a whale of a difference. Borod is made in the form of tubes filled with particles of pure Tungsten Carbide. Because Tungsten Carbide is almost diamond-hard, even such a small amount of this metal applied to the tip of an Undercutter Bit by the Oxy-Acetylene process doubles the cutting efficiency and greatly prolongs bit life. In a typical case a West Virginia mine recently reported that Borod tipped Bits consistently cut an average of 35 percent more coal before dulling than the best heat treated bits obtainable.

This is one of those rare opportunities where a very small investment results in a big saving. Take advantage of it and start tipping your bits today. Borod, made only by Stoodly Company, sells for \$5.50 per pound F.O.B. Whittier, California, and is available on priority ratings of A-1-j or higher.

Stoodly Alloys service worn equipment too —

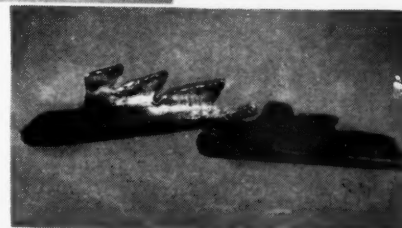
Because of machine scarcity, hundreds of mine owners are now using Stoodly Alloys to reclaim worn equipment. Common procedure is to rebuild the part to within 3/16" of size with ordinary electrodes or rods and apply a final overlay of Stoodly hard metals to prevent further wear. Equipment thus protected delivers longer service than new, resulting in savings in maintenance and replacement costs.

Mining machine clutches of all types can easily be reclaimed by filling in low spots with Stoodly High Carbon and hard-facing with Stoodite. Clutches rebuilt by this method often last three times as long as new unprotected clutches.



Caps on gathering arms may be reclaimed by welding steel strips to worn places and applying a final overlay of Stoodite to retard future wear. The Stoodite should be finish-ground to prevent wear on the chains.

The digging arm at right is worn. The one at left has been rebuilt with Stoodly High Carbon and hard-faced with Stoodly Self-Hardening. Cost of the reclaiming operation is small compared to the cost of a new digging arm. Life is substantially increased.



STOODLY COMPANY • 1134 West Slouson Avenue, Whittier, California

STOODLY COMPANY

Hard Facing Alloys

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BOX NUMBERS in care of any of our New York, Chicago or San Francisco offices count 10 words additional in undisplayed ads.

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The advertising rate is \$6.30 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

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SUPERINTENDENT, ENGINEER—technical graduate, 22 years experience as superintendent, chief engineer, safety engineer, construction, shaft sinking, mechanization, coal washing. Similar position wanted. PW-634. Coal Age, 520 N. Michigan Ave., Chicago, Ill.

DESIRES A POSITION as a Mine Superintendent with a coal company in Virginia or Eastern Kentucky. Twenty five years experience as a supervisor. Reference as to ability and character. PW-642, Coal Age, 330 W. 42nd St., New York, N. Y.

MINE MANAGER OR SUPERINTENDENT. Twenty five years experience as manager and Superintendent of coal mines. First class Mine Manager's Certificate for Illinois. Familiar with mechanical loading equipment. Best references. PW-647, Coal Age, 520 N. Michigan Ave., Chicago, Ill.

CIVIL AND MINING ENGINEER wishes connection with Progressive company, can take full charge of Engineering and Production Departments, 24 years practical experience Anthracite, Bituminous Foreman Certificates. Married, age 44 years. References. PW-648, Coal Age, 330 W. 42nd St., New York, N. Y.

EXPERIENCED MINE SUPERVISOR, with 1st Class Pennsylvania and West Virginia papers and 25 years mining (10 yrs. Mechanical) experience both Anthracite and Bituminous; desires position as Mine Superintendent. PW-649, Coal Age, 330 W. 42nd St., New York, N. Y.

WANTED—Position as Timekeeper, Weigh Boss or Supply Clerk. Fast, accurate and reliable. Draft exempt. Best of references. Write PW-650, Coal Age, 330 W. 42nd St., New York, N. Y.

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COAL MINERS CREW best experience. Looking for work anywhere. Best references. Address 646 Hegney Place, Bronx, New York, N. Y.

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In midwest available on lease basis. Address BO-628, Coal Age, 520 N. Michigan Ave., Chicago, Ill.

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COAL MINES and Acreage, Fire-Clays and Iron-Ores for lease on royalty. Cornett Properties, P.O. Box 235, Grayson, Kentucky.

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EXCELLENT OPPORTUNITY for a coal stripping contractor with 5-yard Walker Dragline for an operation in Northern Illinois. Also, unusual opportunity for two-yard Dragline or larger for extensive acreage in Ohio. Excellent coal, desirable stripping conditions, long term contract. Hott Coal Company, Dover, Ohio. Phone 3-5891.

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Write SW 646, COAL AGE, New York, N. Y. Describe your complete business experience and educational background, enclosing a recent photograph with your letter.

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JOY LOADER, Bradford Breaker Outfit, Four 12 Cubic Yard Sidedump Railroad Cars, Two Skips or Cages, Hoisting Engines, Steel Head-frame with Sheaves, FS-627, Coal Age, 520 N. Michigan Ave., Chicago, Ill.

FOR SALE COAL MINE

Fully equipped anthracite coal mine, lower field, with breaker and all machinery for complete operation. All machinery in first class condition. Now producing 200 tons per day. Breaker capacity 400 Tons. Lease on 420 acres. Additional virgin coal lands adjacent can be leased. Communicate with

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WE LOOK INTO THE EARTH

By using Diamond Core Drills, We drill for Limestone, Gypsum, Tale, Fire Clay, Coal and all other minerals.

PENNSYLVANIA DRILLING CO.
Drilling Contractors
Pittsburgh, Pa.

DIAMOND CORE DRILLING, for any mineral. More than sixty gasoline, steam and electric drills, suitable for any job. **OUR SPECIALTY—testing bituminous coal lands.** Satisfactory cores guaranteed. Prices very reasonable.

HOFFMAN BROS. DRILLING CO.
PUNXSUTAWNEY, PA. Est 1902 Tel 332

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TRANSFORMERS WANTED

in operating condition or burnt out. Mail us list giving complete nameplate data and stating condition.

We Rewind, Repair and Redesign all Makes and Sizes
ALL TRANSFORMERS GUARANTEED FOR ONE YEAR

We invite your inquiries

THE ELECTRIC SERVICE CO., INC.

"AMERICA'S USED TRANSFORMER CLEARING HOUSE"
STATION M Since 1912 CINCINNATI, OHIO

WANT TO BUY

1 to 6 Tyler or Hummer Vibrating Screens.
1—30x30 or 2 smaller roll type Coal Crushers.
1—200 to 300 KW M.G. Set.
1—50 to 60 Ton Locomotive.
20 Ton or Larger Locomotive Crane.
1—Rotary Dryer, 5x60 or equal.
2—1300' or equal air compressors.
60,000 & 25,000 gallon Tank on Steel Towers.

RUSSELL STANHOPE

60 East 42nd Street New York, N. Y.

WANTED:

Shaker or chain conveyors, duck bill and all equipment necessary for complete conveyor mining set-up for 3 to 3 1/2' coal.

W-644, Coal Age

330 W. 42nd St., New York City

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McGraw-Hill Publishing Co., Inc. 330 W. 42nd St., New York City

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C.E. Sullivan 250 v. DC.
C.E. Sullivan Shortwall 250 v. 6' bar

VINE LOCOMOTIVES
6 ton Atlas 250 v. 3 ph. 60 cy. 36" ga.
10 ton Milwaukee GASOLINE

ROTARY CONVERTERS
1—500 kw. G.E. type HC-8, 600 volt,
900 rpm. complete with transformers
and switchboards.
200 kw. G.E. 275 v. DC 900 rpm. complete
with transformers.
150 kw. West. 250 v. 1200 rpm 2200/3/60.

TRANSFORMERS—1 ph. 60 cy.
1—1500 kva. 22000, 6600 Psh.
1—220 kva. 2300, 115/230 All. Ch. 3 ph.
1—150 kva. 22000, 6000 Psh.
1—150 kva. 2200, 230/460 G.E. 3 ph.
1—100 kva. 2200, 110/220 G.E. 3 ph.
1—100 kva. 2200, 110/220 West.
1—100 kva. 6600, 550/440/220 Psh.
1—100 kva. 2200, 220/110 West.
2—75 kva. 2200, 220 Burke 3 ph.
2—50 kva. 2200, 220/440 G.E. 1 ph.
2—50 kva. 11430/6600, 550 Al. Ch.
2—50 kva. 6600, 575 G.E.
1—50 kva. 2200, 220 Burke
2—50 kva. 2200, 110/220 West.

SPEED REDUCERS
Thomas, 3 HP ratio 100:1
Falk, 150 HP ratio 7.21 to 1.
Kerr, 275 HP ratio 3800 rpm. to 720 rpm.

230 V. D.C. MOTORS

HP.	Make	Speed
125	G.E.	1750 rpm.
100	West.	250
85	G.E.	530
75	West.	1700 rpm.
75	West.	475
75	Reliance	1750
50	West.	975 rpm.
50	West.	1700 rpm.

M. G. SETS—SYNCHRONOUS
200 kw. West. 600 v. DC 600 rpm. 2200/
3/60.
150 kw. West. 275 v. DC 600 rpm. 2200/
3/60.
125 kw. Cr. Wh. 250 v. DC 1200 rpm.
220/440/3/60 Ind.
30 kw. West. 60 v. 1750 rpm. dir. con.
220/440/3/60 Ind.

**A.C. GENERATOR—3 ph.
60 cy.**
219 kva G.E. 2200/440/220 v. 200 rpm.

HOISTS
25 HP. Thomas 18" face 20" dia.
40 H.P. single drum AC 220/3/60.
100 H.P. Lidgerwood 2 drum AC or DC
Motor

CENTRIFUGAL PUMPS
4x3 Harris, 320 rpm.
4x4 Weinman, 500 rpm.
6x6 Gould, bronze, 1500 rpm.
8x8 Weinman, bronze.
5x6 Hayton, 750 rpm.
6x6 Minister, 750 rpm.
6x6 American, 1000 rpm., bronze.
6x6 Weinman, 1000 rpm.

ENGINE GENERATOR SETS
50 kw. 250 V. D.C. Generator direct con-
nected to International Diesel Engine.
50 kw. West. 220/3/60 Ames ST.G.A.V.
75 kw. G.E. 220/3/60 Bessemer GAS.
75 kva. Allis Chal. 220/3/60 dir. con.
14x14 Steam Engine.
80 kw. West. 250 V. Belted 110 Bessemer GAS.
175 kw. G.E. 2200/3/60 Ridgeway STEAM.
225 kw. Elec. Machy. 2300/3/60 Ideal STEAM.

TURBINE
1—Kerr Steam Turbine 450 BHP 3800
rpm., 5" intake 12" exhaust with Kerr
Reduction Unit 3800 to 720 rpm., 115 lb.
pressure.
1—1000 kw. G.E. Turbo 6600/3/60 1500
Psh.

SLIPRING MOTORS—3 ph. 60 sv.			
No.	HP	Make	Type
1	1500	Allis Chal.	ANY
1	700	G.E.	MT-432
1	400	West.	CW
1	400	West.	CW-967A
1	400	G.E.	I-M
1	260	Burke	EMV-65
3	250	G.E.	I-M
3	250	G.E.	I-M
3	200	G.E.	I-M
1	200	G.E.	I-M
1	200	West.	CW-956A
1	150	G.E.	I-M
1	100	West.	CI
1	75	West.	CI
1	60	Triumph	C-16
1	52	G.E.	ITC-5013
2	50	Allis Chal.	ANY
1	50	West.	HF-12A
1	50	West.	CW-461
1	50	G.E.	HF
2	50	West.	CW-636A
2	40	G.E.	MT-332
1	40	G.E.	MTC-5522
1	40	G.E.	MT-342
1	40	Allis Chal.	MT-552
1	25	G.E.	MW
1	25	West.	CI

SQUIRREL CAGE MOTORS—3 ph. 60 cy.			
HP	Volts	Make	Type
500	2200/440/220	West.	CS
400	2200/440/220	West.	CS
450	2200/440/220	West.	CS
400	2200/440/220	West.	CS
350	2200/440/220	West.	CS
300	2200/440/220	West.	CS
200	2200/440/220	West.	CS
200	220/440	West.	CS
200	2200	West.	CS
150	550/220/440	G.E.	CS
150	220/440	G.E.	KT-562
150	2200/440/220	Al. Ch.	Syn.

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Locomotives—Mining Machines
Pumps—Motors—Transformers
Steel Tipples—Rescreeners
Steam Hoists—Electric Hoists
Compressors—Loading Booms
Engines—Generators—Scales
Miscellaneous Mine Equipment

Our own modern machine shop is avail-
able to repair and modernize your
equipment.

Complete Mines dismantled and sold.

HAIR EQUIPMENT COMPANY
Office and Warehouse
Reed and Election Streets
BENTON, ILLINOIS

RAILS—CARS

All sections of rails and good serviceable second
hand cars, all gages, also spikes, bolts, frogs,
switches and ties

M. K. FRANK

480 Lexington Ave. 450 Fourth Ave.
New York City Pittsburgh, Pa.

MINE HOISTS

- 1—Diamond 12" Drum 20 HP electrical equipment.
- 1—Vulcan 30" Band Friction with 50 HP electrical equipment.
- 1—Flory 48" Band Friction with 150 HP electrical equipment.
- 1—Connellsville 54" Drum Haulage Hoist with 100 HP electrical equipment.
- 1—Lidgerwood 54" Drum with 150 HP electrical equipment.
- 1—Lidgerwood Cyllindo-Conical Drum 200-1 1/4 with 350 HP electrical equipment.
- 1—Vulcan Cylinder Conical Drum Shaft Hoist, 350 ft. 1 1/2" rope with 400 HP motor and control.
- 1—Nordberg Cyllindo-conical Shaft 400 ft. 1 1/2" rope with 600 HP motor and control.

And other hoists to suit all mining conditions

Jones Mining Equipment Co.
541 Wood Street Pittsburgh, Pa.

ROTARY CONVERTERS

500 KW WEST. SYN. 275 V., 6 Ph., 60 Cy., 1200 RPM. Pedestal type, 2300/4030 V. Transformers.
300 KW G.E. SYN. 275 V. H.C.C., 6 Ph., 60 Cy., 1200 RPM. form P. 2300/4000 V. Transformers.
300 KW G.E. SYN. 575 V. H.C.C., 6 Ph., 60 Cy., 1200 RPM. form P. 2300/4000 V. Transformers.
200 KW AL-CH SYN. 275 V. 6 Ph., 60 Cy., 1200 RPM. Pedestal Type, 2300/4000 V. Transformers.
150 KW R.W. SYN. 275 V., 6 Ph., 60 Cy., 1200 RPM. Pedestal type, 440/2330/4000 V. Trans.

MOTOR GENERATORS

300 KW G.E. SYN. 275 V. 2300/4000 V. 3 Ph. 60 Cy. 80% P.F. 1200 RPM. Manual Switchgear
300 KW G.E. SYN. 600 V. 2300/4000 V. 3 Ph. 60 Cy. 80% P.F. 1200 RPM. Manual Switchgear
200 KW G.E. IND., 275 V., 440 V., 3 Ph., 60 Cy., 720 RPM. Manual Switchgear.
201 KW G.E. SYN., 275 V., 2300/4000 V., 3 Ph., 60 Cy., 80% P.F., 1200 RPM. Manual Switchgear
200 KW G.E. SYN., 275 V., 2300 V., 3 Ph., 60 Cy., 100% P.F., 720 RPM. Manual Switchgear.
200 KW G.E. SYN. 600 V. 2300/4000 V. 3 Ph. 60 Cy. 80% P.F. 1200 RPM. Manual Switchgear
100 KW WEST. SYN. 275 V., 2300 V., 3 Ph., 60 Cy., 100% P.F. 930 RPM. Manual Switchgear.

LOCOMOTIVES

13-T JEFFREY, 250 V., MH-110 Mts., 44"-36" Ga.
10-Ton GOODMAN, 250 V., 29-A Mts., 36" Ga.
10-Ton GOODMAN, 500 V., 36-B Mts., 42" Ga.
8-Ton WESTGHE, 250 V., 906 Mts., 48"-36" Ga.
6-Ton WESTGHE, 250 V., 904-O Mts., 42"-36" Ga.
5-Ton WESTGHE, 250 V., 902-B Mts., 56"-36" Ga.
4-Ton WESTGHE, 250 V., 902-C Mts., 36" Ga.
4-Ton GOODMAN, 250 V., 42-I Mts., 44" Ga.

Each unit listed above is owned by us and is available now for immediate purchase.

WALLACE E. KIRK COMPANY
Incorporated

501 Grant Building Pittsburgh, Pa.

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45 lb.—50 lb.—56 lb.—60 lb.—70 lb.—80 lb.

Splice Bars Lock Washers Tie Plates Bumping Posts
Track Bolts Track Spikes Cross Ties Frogs and Switches

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Stripping Contractors Attention.
WIRE CENTER CABLE FOR SALE
AT A GREAT SAVING

1-1/2" dia. 6x19, IMPROVED FLOW STEEL, IN-
DEPENDENT WIRE ROPE CENTER. Lengths
run from 1500 feet to 2000 feet each reel.
Immediate shipment

TERRENCE P. WYNN

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MOTOR GEN. SET

300 KW, 600 Volt, 900 rpm, Westing-
house to a 450 HP, 3 phase, 60 cycle,
80% P.F. Westinghouse Synchronous
motor with A.C. & D.C. panels.

GEORGE SACHSENMAIER CO.
Holmesburg, Philadelphia, Pa.

RAILS and ACCESSORIES

RELAYING RAILS—Super-quality machine-recon-
ditioned—not ordinary Relayers.
NEW RAILS, Angle and Splice Bars, Bolts, Nuts,
Spikes, Frogs, Switches, Tie Plates, and all
other Track Accessories.

Phone, Write or Wire

L. B. FOSTER COMPANY, Inc.
PITTSBURGH NEW YORK CHICAGO

NEED DUMP CARS?

IMMEDIATE DELIVERY

12, 24-yd. Koppel 24, 16-yd. Western
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3, 20-yd. Western 62, 12-yd. Western

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OTHER TYPES OF CARS TOO

Also Locomotives, Cranes, Shovels, Etc.

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6 YD. STRIPPER SHOVEL

200-B Bucyrus 6 years old. 75 ft. Boom, 60 ft. Dipper stick, 6 yd. Dipper Steam Shovel.

SHOVEL & DRAGLINE:

1 yd. 120 B Bucyrus Electric Shovel & 100 ft. Boom Dragline
2 1/4 yd. 100 B Elec. Shovel.

DIESEL DRAGLINES

3W 4W & 5W Monighan Walkers. 90 to 110 ft. booms.

3 Yd. P.H. 900, 97' boom.

2 1/2 Yd. 48B Bucyrus 80' boom.

2 Yd. 750 Lima, 60' boom.

AIR COMPRESSORS:

(7) Steam 66 ft., 300 ft., 600, 1000 & 1940 ft.
(12) Belted, 360, 676, 870, 1000, 1300 ft.
(12) Diesel 105, 315, 520, 676 & 1000 ft.
(16) Electric, 1300, 1500, 2200, 2600, 5000 ft.
(14) Gasoline, 110, 160, 220, 310 & 370 ft.

COAL CRUSHERS:

Jeffrey Single Roll 18x18, 24x24 & 30x30
Link Belt 26x24 Double Roll Crusher

HYDRAULIC CARWHEEL PRESSES:

100 Ton, 150 Ton, 300 Ton, 300 & 400 Ton (aid well - Niles - Wood - Watson Stillman)

RUBBER CONVEYOR BELTS:

1000' 60", 600' 30", 300' 20", 1600' 42", 900' 48", 1450' 36", 1200' 24", 900' 18", 600' 16", 350' 14"

CONVEYOR PARTS:

Idlers, Head & Tail Pulleys, Steel Frames, Trip per, etc., 14 in., 60 in. Large Stock here.

SYNC. MOTOR GENERATORS & ROTARIES:

100 KW Ridgway 1200 RPM 3/60/2300/250 275
150 KW G.E. 1200 RPM 3/60/2200-250-275
200 KW Ridgway 900 RPM 3/60/2200-250-275
3-100 KW G.E. 275 v. 1200 RPM Rotaries

STORAGE BATTERY LOCOMOTIVES:

2 1/2 ton Westinghouse 24 ga. New Batteries
2-4 ton G.E. 30 in. ga.
3-5 ton Mancha 30 in. ga.
4-5 ton G.E. 36 in. ga.
3-7 ton Goodman 36 ga. Battery & Trolley
8-6 ton Baldwin Westgh. 42 ga. & 36 ga.

TROLLEY LOCOMOTIVES:

2 1/2 ton Westinghouse 24 ga.
4-6 ton & 3-5 ton Goodman 36 ga.
3-6 ton Goodman 30 ga.
4-6 ton Goodman 42 ga.
5-6 ton Westinghouse 42 ga.
2-8 ton Goodman 36 ga.
10 ton Goodman 42 ga. & 13 ton Jeffrey

VIBRATING SCREENS:

9 Tyler Hummer 3x6, 4x5, 4x8 & 4x10
2 Robbins Gyrex 4x8 1/2
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CARS:

120-4 ton 42 ga. S.D. Mine Cars
60-Western 16 20-30 yd. Side Dump

SHOVELS, CRANES & DRAGLINES:

3 W 90' Boom, 6 W 160' Boom, Model 6150, 175' Boom, Diesel, Monighan Walkers
1 yd. K 30 Link Belt 50' Boom Crane
2 yd. Page 70' Boom Diesel Dragline
1 1/4 yd. Marion 450 Elec. Shovel
1 1/4 yd. Lima Diesel Shovel & Dragline
2 yd. Link Belt Elec. Shovel & Dragline
25 ton Browning 50' Boom Loco. Crane
7 Conway 20A, 30A, 50A, 60 & 75 Muckers

MINE LOADERS:

Junior Joy 36 ga. Low Pan
Conway 20 Mucker
3-5 BU & 7 BU 36 or 42 ga. Joy
9-Goodman 260 & Jeffrey 44L

MISCELLANEOUS

5'x160' Traylor Rotary Dryer
100 HP G.E. 3/60/440 v.-900 RPM Elec. Motor
6 Goodman 12CA & 12 DA 6 ft. Cutters
8x8 Sullivan Mine Compressors
Clamshell Buckets 1/2, 1, 1 1/2 & 2 yd. Cap.
30 ton & 12 ton Vulcan Std. Ga. Gas. Loco.

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LOCOMOTIVES

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Lathes, Shapers, Milling Machines, Hydraulic Presses, Hack saws, every type of tool for the maintenance shop. Write for catalogue.

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15-6-ton Gathering Locomotives, G. E., Jeffrey and Goodman.

7-8-ton Locomotives, G. E., Westinghouse and Jeffrey.

5-10-ton Locomotives, General Electric, Goodman and Jeffrey.

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The above locomotives are completely rebuilt-36" to 48" gauge.

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2-300 KW G. E. Synchronous Rotary Converters, type HCC-6, form P, 1200 RPM, 250/275 volt DC, switchboards and all necessary switchgear, including 2300 volt transformers.

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1-Goodman type 97-30, 30" Belt Conveyor, 1000' centers, 121 intermediate sections.

1-Goodman type 97-30, 30" belt conveyor, 959' centers, 117 intermediate sections. Practically new.

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15-5-BU Joy Loading Machines. Perfect operating condition.

15-G-20 Goodman Automatic Duck Bills. Practically new.

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25-Sullivan CE-7 AC, 220/410 volt. Just taken out of service. Excellent condition.

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6 1/2-7 1/2 yd, Bucyrus 320-B; Railroad Trucks

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37 years' experience

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Goodman Standard & Universal.
AC & DC Rebuilt & Guaranteed.

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5 to 20 ton.

STRIPPING SHOVELS

M. G. SETS & ROTARY CONVERTERS

PUMPS and FANS

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Will buy, sell or exchange.
What do you need?

The Industrial Equipment Corp.

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4 Ton Type D Ironton 36" Ga. with 36 cells, 19

Plate Exide Battery.

5 1/2 Ton Type D Ironton 36" Ga. with 48 cells, 21

Plate Exide Battery.

Charging M. G. Sets & Panel for each loco.

5 Ton Jeffrey 42" Ga. 2 motor.

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FOR SALE

1-Goodman type 12G3 Mining Machine
COAL CUTTER - In good operating condition, and complete with following: 6 1/2 ft. cutter bar. Standard Goodman cutter chain. 70 Tooth beebie Gear. The overall height is 35". The machine is mounted on Standard 42 gauge truck 14" wheels. The tail rope on the machine is 1/2-H diameter and 20 ft. in length. The machine also has 210 feet of 3 conductor all rubber covered mining machine cable. The machine has approximately \$300.00 worth of extra parts including set of 8" wheels.

Price-FOB Shipping Point
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MINING MACHINE

1 low vein #212 Goodman Coal Mining Machine, 6 1/2 ft Cutter bar with trucks in first class shape, A-C Current. Price \$2500.00.

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Desirable Electric Equipment—Prompt Shipment From Our Warehouse

HP	Make	V.	Speed
350	Al. Ch.	2200	600
2-75	Westgh.	2200	900
75	Westgh.	220	1800

M-G SETS 3 ph. 60 cy. (Syn.)			
150	KW West.	550 v. DC	2200 v. AC—1200 RPM
150	KW Ridgway	250 v. V.	2300 v. AC 900 RPM
125	KW G.E.	250 v. D.C.	2200/3/60—1200 RPM
100	KW Cr. Wh.	2502 DC	440/3/60 1200 RPM
100	KW Westgh	250 v.	DC 2200 v. AC 1200 RPM
100	KW G.E.	550 v. D.C.	2200/3/60 A.C. 900 RPM
90	KW Al. Ch.	250 v.	2200 v. AC 900 RPM

LOCOMOTIVES			
4	Ton Ironton	36" Ga.	Type D with 36 cells 19 plate
	Exide Battery.		
5 1/2	Ton Type D Ironton	36" Ga.	with 48 cell 21 plate
	Exide Battery.		
	Charging M.G. Set & Panel for each loco.		
5	Ton Jeffrey Storage Battery	42 to 44" Ga.	2 BB motors, Battery box on top.
6	Ton Whitcomb	450 v. 40" Ga.	
8	Ton Jeffrey	250 v. 42" Ga.	MH 100 Motors
10	Ton West.	250 v. 42" Ga.	

MINING MACHINES			
35	B Jeffrey	250 v. 36" Ga.	#18972, 6' bar.
35	B Jeffrey	250 v. 36" Ga.	truck 6' bar #11,416.
2	C E 7	Sullivan	DC standard 30 HP
1	12 G3	Goodman	Std. Truck 220/3/60 6' bar.

SLIP RING & SQ. CG. MOTORS (3 ph. 60 cy.)

HP	Make	Speed	Wdg.	Type
700	G.E.	393	S.R.	MT 432
400	West.	500	S.C.	CS
300	G.E.	600	S.R.	IM
250	G.E.	600	S.R.	I-L
200	Cr. Wh.	440	S.R.	28
200	G.E.	600	S.R.	I-L
200	Al. Ch.	600	S.C.	
150	G.E.	600	S.R.	I-L
125	West.	1800	S.C.	C.S.
125	G.E.	600	S.R.	I-L
125	Al. Ch.	435	S.R.	
125	Burke	1200	S.C.	
100	F.M.	600	S.C.	BB
100	Burke	900	S.C.	
100	GE	500	S.R.	MI-25 cy
75	West.	575	S.R.	CW368A
75	G.E.	865	S.C.	KT

HOISTS
75 HP Ottumwas sgl. fr. drum 36" Dia. 30" wide 8" flanges. eared 75 HP CI Westgh. slip ring motor with rev. drum control

75 HP Lidgerwood sgl. fr. drum
50 HP Diamond 2 drums same Shaft
30 HP Clyde sgl. drum AC Motor
25 HP Thomas sgl. drum AC Motor
15 HP Lidgerwood sgl. dr. AC Motor Pumps

400 TRANSFORMERS (Westgh. & GE 1 ph.)			
Qu.	KVA	Pr. V.	Sec. V
3	1	2080/2200	115/230
5	2	"	"
100	5	"	"
137	7	"	"
71	10	"	"
10	15	"	"
25	25	"	"
1	30	"	"
3	37 Rotary	4400/185	"
6	50	2080/2200	"
2	100	"	"
1	150	3 Phase	230/460

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100 KW 250 v. DC Westgh.—Skinner Engine

AIR COMPRESSORS
550 cu. ft. 100# Bury 2 stage
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2—355 cu. ft. 100# Chg. Pn. 12 x 10
160 cu. ft. Chic. Pneu. 100#

D. C. MOTORS
1 to 125 HP, all speeds

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Guaranteed
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CONVEYOR and TRANSMISSION BELTING

CONVEYOR BELTING ABRASIVE RESISTANT COVERS				TRANSMISSION BELTING HEAVY-DUTY FRICTION SURFACE				ENDLESS "V" BELTS			
Width	Ply	Top-Bottom	Covers	Width	Ply	Width	Ply	Width	Ply	Width	Ply
48"	8	1/2"	1/16"	18"	6	10"	6	6"	5	"A"	WIDTH — All Sizes
42"	5	1/2"	1/16"	16"	6	10"	5	5"	5	"B"	WIDTH — All Sizes
36"	6	1/2"	1/16"	14"	6	8"	6	4"	5	"C"	WIDTH — All Sizes
30"	6	1/2"	1/16"	12"	6	8"	5	4"	4	"D"	WIDTH — All Sizes
30"	5	1/2"	1/16"	12"	5	6"	6	3"	4	"E"	WIDTH — All Sizes
24"	5	1/2"	1/32"								Sold in Matched Sets
24"	4	1/2"	1/32"	ELEVATOR BELTING							
20"	5	1/2"	1/32"	HEAVY DUTY							
20"	4	1/2"	1/32"	RUBBER COVERED							
18"	4	1/2"	1/32"	Width	Ply	Top-Bottom	Covers	RUBBER HOSE			
16"	4	1/2"	1/32"	12"	6	1/16"	1/16"	ALL SIZES FOR			
14"	4	1/2"	1/32"	14"	6	1/16"	1/16"	AIR — WATER —			
12"	4	1/2"	1/32"	16"	6	1/16"	1/16"	STEAM — SUCTION —			
				18"	6	1/16"	1/16"	FIRE — WELDING			
								ETC.			

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LINK-BELT UNLOADING TOWER

SUITABLE FOR COAL OR ORE
GANTRY TYPE • CAPACITY 750 T.P.H.
RAIL SPAN 44' • OVERALL HEIGHT 114' WIDTH 166'
COMPLETE WITH WIRING AND 8 SELF-CONTAINED
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1—334-AA Goodman low vein slabbing machine
30" high
1—124-EJ Goodman slabber
1—29-C Jeffrey Arcwall
6—CE-7 Sullivan
1—CE-10 Sullivan
1—CR-2 Sullivan, low vein
1—CE-7 Sullivan, 220 volt A.C.

LOADING MACHINES
1—8-BU Joy
1—44-DD Jeffrey

LOCOMOTIVES
1—6-Ton Ironton, 250 volt with G.E. reel 26" high O.A.

MISCELLANEOUS
1—150-KW, 250 volt steam plant
1—150-KW, 500 volt M-G set
1—15-Ton bridge crane 50' span.
1—Lot 2-phase A.C. motors
1—75-HP. West. SK Generator

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- 1—300 KW G. E. Syn. M. G. Set, 3/60/2300-80% PF, 275 V DC.
- 1—200 KW West. Rotary Converter, 275 V DC with 2300 V transformers.
- 1—35 KW 125 V Battery Charging Set.

MINE LOCOMOTIVES

- 1—6 ton Jeffrey MH 88 250 V motors.
- 1—6 ton G.E. with 250 V motors.
- 2—5 ton G.E. HM 825 motors with gathering reel.

CUTTING MACHINES

- 8—35B Jeffrey 250 V Shortwall.
- 1—35BB Jeffrey AC Shortwall.
- 1—12G3 Goodman AC Shortwall.
- 2—12AB Goodman 210 V DC Shortwall.
- 1—29B Jeffrey Arcwall DC.
- 1—29C Jeffrey Arcwall DC.
- 1—29LE Jeffrey with turn over head AC motors.

MISCELLANEOUS

- 1—90L Elevating Conveyor.
- 1—Sullivan Bit Sharpener.
- 1—36" x 36" single roll Crusher.

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SUBSTATION EQUIPMENT

- 1—100 KW, 250/275 volt, DC, G.E. Rotary Converter with 2300 volt Transformer and manual switchboards.
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(Can be rewound for desired voltage)
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1—10 ton, 31-1-4-T.
1—6 ton, 30B, 43" 1—3 ton.
1—5 ton, W-1-2, 36"
Westinghouse: All 250 volt.
1—4 ton, 902, 43" 1—18-ton, 102, 42"
1—904 c. 44", 500 volt. Also 906 motors.
1—10 ton, 915
G.E.: All 250 volt, 5 ton 825, 41"
6 ton 803, 44", as is 4 ton 1022, 44, as is
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AERIAL TRAMWAYS * HOISTS * PUMPS * MOTORS * TRANSFORMERS * BOND WELDERS * RESISTANCE COMPRESSORS * DUMPS SPEED REDUCERS
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36"—48" and 60" with adjustable pitch
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Jeffrey, 35B, 29B, and 4—28A 250 V. 2—
29C with drop bar support.
Goodman, 12A, 12AB, 12AA, 12G3A, 124EJ.
1—12G3 250 volt and 2—112 DA, 500 volt.
2—Permissible Type 12CA.

Sullivan, CE7, CE9, CE10, CR10 Low Vein
1 Class 5 Buddy and Shearing Machine.
AC and DC.

SUBSTATIONS—275 volts, D.C.

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1—150 KW West. Rotary.
2—150 KW, 2—100 K Ridgeway M-G Sets.
1—150 KW West. M-G Sets.
1—200 KW G.E. Rotary Converter.
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We offer the following for sale, now located at
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complete with manual switchboard and start-
ing equipment 2200/250, 1740 RPM, 3 phase,
60 cycle.
- 1 Flory Hoist loose drum dia. 48" width 42"
flange 1 1/2"
- 1 100 HP Allis Chalmers slip ring Motor for
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starter complete.
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- 4 5" Angle Valves, flange type, bolt hole centers
9 1/2"—high pressure Crane 175.
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37"—high pressure.
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Inch, 9 Ply, 32 Oz., 3/16" Top, 1/32"
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COMPLETE MINE EQUIPMENT

2 Steel Tipples, Steam Hoist, Shaker and
Engine, Boilers, Engine and Generator 150
K.W. Scale, 10 ton Locomotive, Pump
Mine Cars 36" gage, Rail, Wire.

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One number 4 Myers-Whaley Loading Ma-
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One Oldroyd Loading Machine, in good
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type equipment 250 Volts DC, 42" gauge.
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Five La-Del and two Northern Conveyors
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uipment, 250 Volts DC, 42" gauge. In good
condition.

One Barbour-Green retail yard conveyor,
with 30 foot boom. In good condition.

Apply F-S 645 Coal Age
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\$2,500

35 h.p. Goodman Shortwall Mining Machine

Type 12-A, track gauge 42 inches, in working con-
dition, with one Post Drill and Shield, Drum and
Master Gear for Jeffrey Cable Reel.

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OUTFIT BUILT NEW IN 1936. IN EXCEPTIONALLY FINE
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160 USRA construction; built 1921-1922; with A-B brakes; 1880 cubical feet capacity.
363 built 1910-1915; with KD-1012 brakes, 1683 feet capacity.

ALL HAVE FULL "U" CAST STEEL TRUCK FRAMES

Purchaser must buy all.

PRICE: \$1700.00 each f.o.t. Pennsylvania.

TERMS: Cash with purchase.

DELIVERY CAN COMMENCE IMMEDIATELY AND BE COMPLETED IN ABOUT 60 DAYS—
AND VERY POSSIBLY SOONER.

Some \$30,000 to \$40,000 NEW REPAIR MATERIALS also available which you
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TIME and EXPEDITION ESSENTIAL and DESIRABLE.

Yours for Victory.

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37 years' experience

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"ANYTHING containing IRON or STEEL"

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CAST IRON—PRESSED STEEL—SOLID OR SPLIT

SIZES 1 1/2 x 1 1/2 TO 84 x 20

20—58x12	20—36x10	800—26x4	400—12x4
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AND 30,000 OTHERS IN STOCK

Also in Stock New and Used Power Transmission Equipment of All Kinds
NO PRIORITIES NEEDED FOR USED TRANSMISSION EQUIPMENT

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"The Test of Time Since '99"

NEW "SEARCHLIGHT" ADVERTISEMENTS

received by Sept. 25th, will appear in the
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space available.

Address copy to the
Departmental Staff

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Two—United Iron Works Size
8 MSD—4 Stage 3000 GPM—
700 Ft. Head 10" Suction 8"
Discharge—700 H.P. G.E. Mot-
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Cycle—145 Amps.

Many Other Pumps Various
Sizes and Capacities
IMMEDIATELY AVAILABLE

PLEASANTVILLE CONSTRUCTORS,
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CHELSEA

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FOR SALE

1—Ogle Automatic Coaling Machinery
Co. Elevator, Tower and Hoist with
1-Ton Bucket, automatic panel
1—Robine Belt Coal Conveyor 190' long
1—Robine Unloading Machine
Misc. Power House Equipment including
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15,000'—3 1/4" Seamless Steel Boiler Tub-
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**WE BUY AND SELL
MOTORS
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MOTOR GEN. SETS
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AIR CIRCUIT BREAKERS**

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An asterisk preceding manufacturer's name indicates detailed information may be found in the 1942 *COAL MINING CATALOGS*.
Where † appears after a company's name the advertisement does not appear in this issue, but was in preceding issues.

[illegible]

MANUFACTURING CO. WELLSTON, OHIO
DESIGNERS AND BUILDERS OF COAL HANDLING EQUIPMENT FOR OVER 75 YEARS

DESIGNERS AND BUILDERS OF COAL HANDLING EQUIPMENT FOR OVER 25 YEARS

Sand and Gravel Screening and Washing Machinery

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which would **YOU** rather handle?



● We hope you have never had a lost-time accident due to wire rope. Some operators have—and *this* is no time to have workmen laid up with a blood-poisoned hand. Some operators have drastically reduced compensation claims by adopting American Cable **TRU-LAY PREFORMED**—the safer rope. . . . Being preformed, American Cable **TRU-LAY** is tractable—flexible—easy to handle. It resists kinking and snarling. Worn or broken crown wires lie flat and in place—refusing to wicker out to puncture hands or tear clothing. . . . Furthermore, being preformed **TRU-LAY** will last longer than ordinary cable. It has far greater resistance to bending fatigue. That means reduced machine shutdowns for replacement—steadier production—greater dollar value. . . . All American Cable ropes identified by the Emerald strand are made of Improved Plow Steel.

AMERICAN CABLE DIVISION

Wilkes-Barre, Pa., Atlanta, Chicago, Detroit, Denver, Los Angeles,
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AMERICAN CHAIN & CABLE COMPANY, Inc. BRIDGEPORT, CONNECTICUT



ESSENTIAL PRODUCTS . . . AMERICAN CABLE Wire Rope, TRU-STOP Emergency Brakes, TRU-LAY Control Cables, AMERICAN Chain, WEED Tire Chains, ACCO Malleable Iron Castings, CAMPBELL Cutting Machines, FORD Hoists and Trolleys, HAZARD Wire Rope, Yacht Rigging, Aircraft Control Cables, MANLEY Auto Service Equipment, OWEN Springs, PAGE Fence, Shaped Wire, Welding Wire, READING-PRATT & CADY Valves, READING Electric Steel Castings, WRIGHT Hoists, Cranes, Presses . . . *In Business for Your Safety*

ROLL
Your Cars
Over
to Unload
and
Keep 'Em
Moving



The LINK-BELT Rotary R. R. Car Dumper Unloads up to 30 Cars per Hour

The many Link-Belt rotary railroad car dumpers now in service, are playing an important role in the battle of transportation. This unit is capable of unloading all types of open-top railroad cars—varying from 26 ft. to 50 ft. long; 7 ft. to 12½ ft. high; 8½ ft. to 11 ft. wide; and with capacities up to 120 tons. The number of cars it can handle in a given time depends upon the switching and track facilities for supplying loaded cars and removing empties. A full cycle of dumping and returning to normal position is accomplished in 1½ minutes. The whole operation is so simple, automatic and foolproof that unskilled labor can perform it readily; it is completely under control at all times and can be stopped instantly at any point of the cycle. Send for Book No. 1004.

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